DVP-K350

RMT-D118E

SERVICE MANUAL

Self Diagnosis Supported model

Chinese Model
Hong Kong Model
Singapore Model
Taiwan Model

SPECIFICATIONS

CD/DVD player

Laser Semiconductor laser
Signal format system
NTSC/PAL

Audio characteristics

Frequency response
DVD (PCM 96 kHz): 2 Hz to 44 kHz (±1 dB)*
DVD (PCM 48 kHz): 2 Hz to 22 kHz (±0.5 dB)
CD: 2 Hz to 20 kHz (±0.5 dB)
Signal-to-noise ratio
More than 110 dB (AUDIO OUT connectors only)
Harmonic distortion
Less than 0.003 %
Dynamic range
More than 100 dB (DVD)
More than 97 dB (CD)
Wow and flutter
Less than detected value (±0.001 % W PEAK)

Outputs and inputs

	Jack type	Output level	Load impedance
AUDIO OUT (1, 2)	Phono jacks	2 Vrms (at 50 kilohms)	Over 10 kilohms
DIGITAL OUT (OPTICAL)	Optical output connector	–18 dBm	Wave length: 660 nm
DIGITAL OUT (COAXIAL)	Phono jack	0.5 Vp-p	75 ohms terminated
VIDEO OUT (1, 2)	Phono jacks	1.0 Vp-p	75 ohms, sync negative
S VIDEO OUT (1, 2)	4-pin mini DIN	Y: 1.0 Vp-p C: 0.3 Vp-p (PAL) C: 0.286 Vp-p (NTSC)	75 ohms, sync negative 75 ohms terminated
COMPONENT VIDEO OUT (Y, CB/B-Y, CR/R-Y)	Phono jacks	Y: 1.0 Vp-p CB/B-Y, CR/R-Y: 0.7 Vp-p	75 ohms, sync negative 75 ohms
AUDIO OUT (WOOFER)	Phono jack	2 Vrms (at 50 kilohms)	Over 10 kilohms
MIC 1, 2	Standard jacks		

General

Power requirements
220 to 240 V AC, 50/60 Hz (Singapore)
110 V AC, 50/60 Hz (Hong Kong, Taiwan)
220 V AC, 50/60 Hz (Chinese)
Power consumption
15 W
Dimensions (approx.)
430 × 69 × 260 mm (w/h/d)
incl. projecting parts
Mass (approx.)
2.9 kg
Operating temperature
5 °C to 35 °C
Operating humidity
25 % to 80 %

Supplied accessories

- Audio/video connecting cord (1)
- Remote commander (remote) RMT-D118E (1)
- R6 (size AA) batteries (2)
- Plug adaptor (1) (Hong Kong)

* *The signals from AUDIO OUT connectors are measured. When you play PCM sound tracks with a 96 kHz sampling frequency, the output signals from the DIGITAL OUT (OPTICAL, COAXIAL) are converted to 48 kHz (sampling frequency).*

Design and specifications are subject to change without notice.

CD/DVD PLAYER

SONY®

http://getMANUAL.com

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

WARNING!!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 25 cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

CAUTION:
The use of optical instrument with this product will increase eye hazard.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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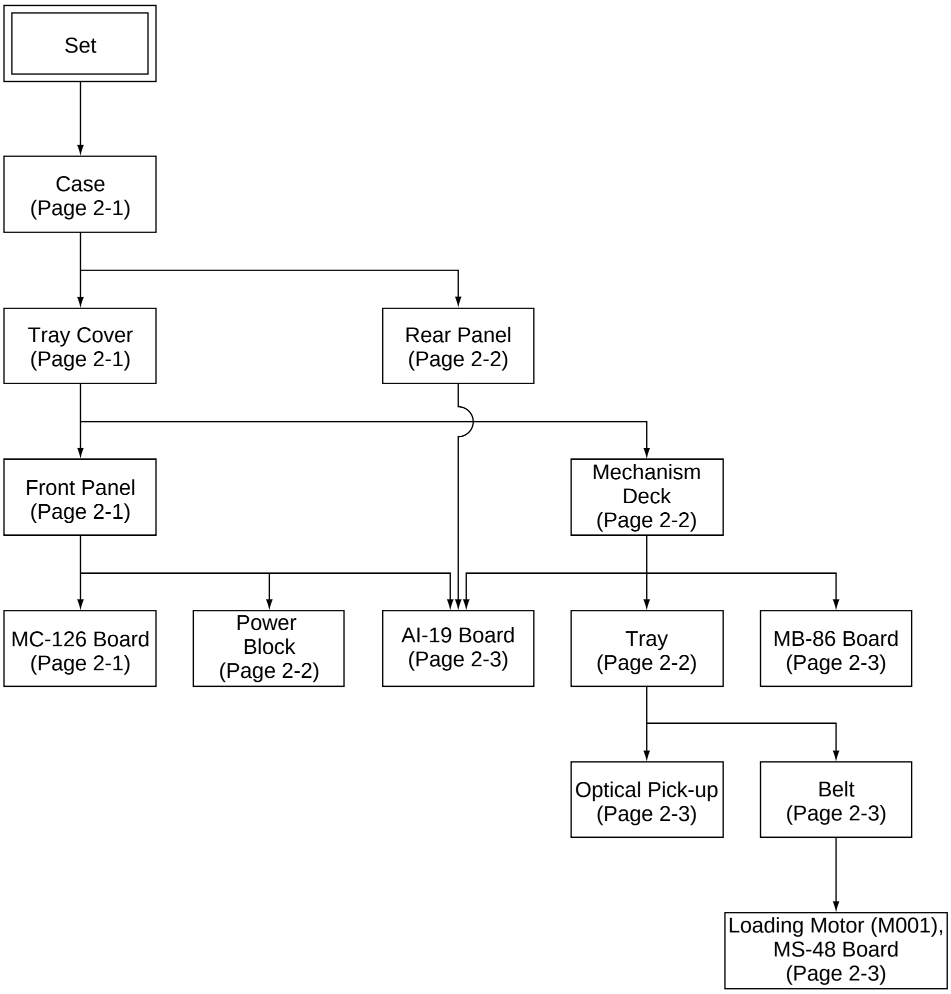
SERVICE NOTE

1. DISASSEMBLY

- This set can be disassembled in the order shown below.



2. DISC REMOVAL PROCEDURE (at POWER OFF)

1) Insert a tapering driver into the aperture of the unit bottom, and move the lever of chuck cam in the direction of the arrow Ⓐ. (See Fig. 1)
2) Draw out the tray in the direction of the arrow Ⓑ, and remove a disc. (See Fig. 1)

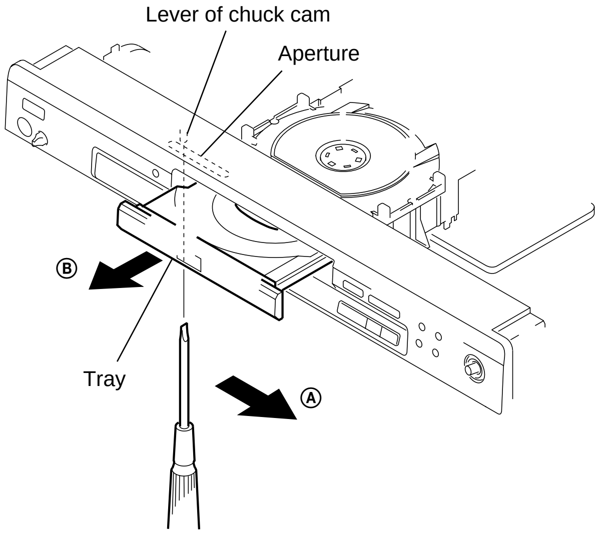


Fig. 1

3. HOW TO SERVICE MB-86 BOARD

1) Remove the case from the set. (Refer to 2-1)
2) Remove the mechanism deck. (Refer to 2-7)
3) Remove the MB-86 board. (Refer to 2-10)
4) Set the CK-MD board as shown in Fig. 2.

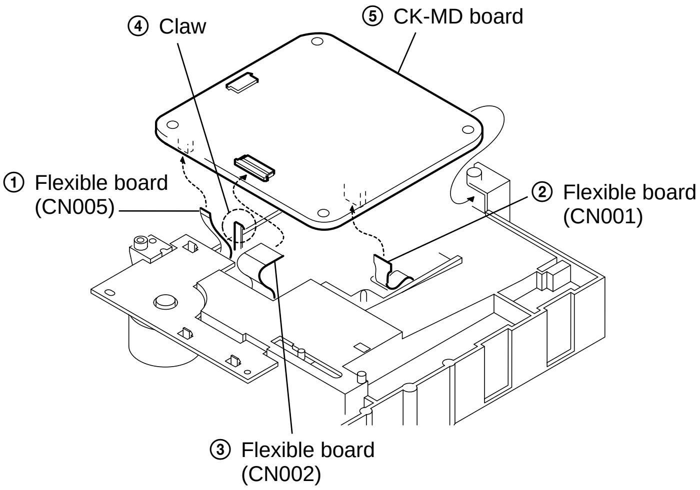


Fig. 2

5) Set the MB-86 board as shown in Fig. 3.

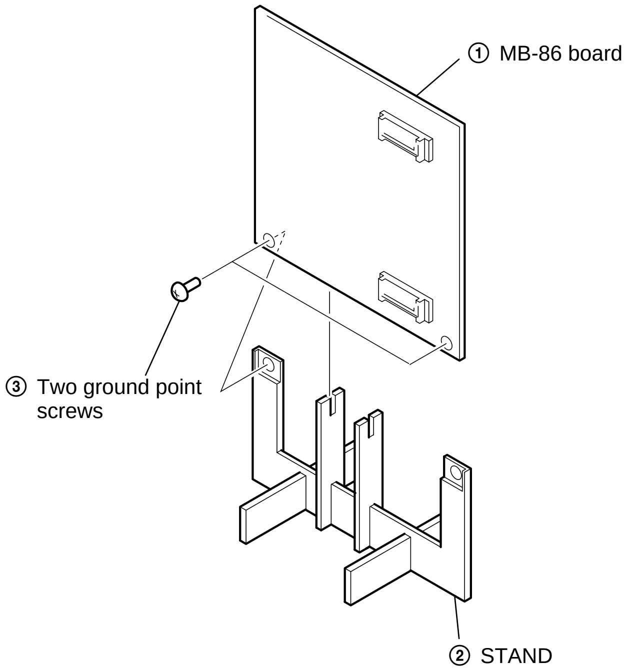


Fig. 3

6) Set the CK-MB board as shown in Fig. 4.

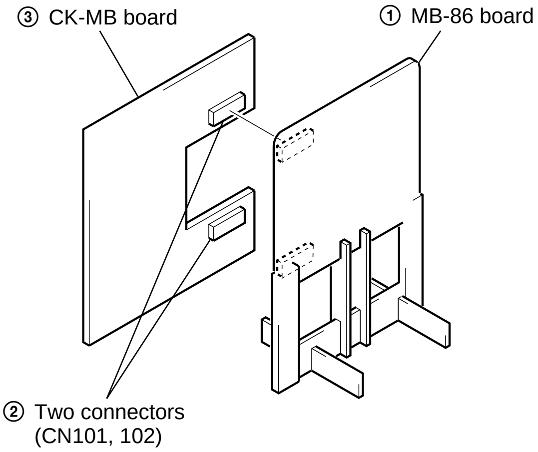


Fig. 4

7) Set the CK-AI board as shown in Fig. 5.

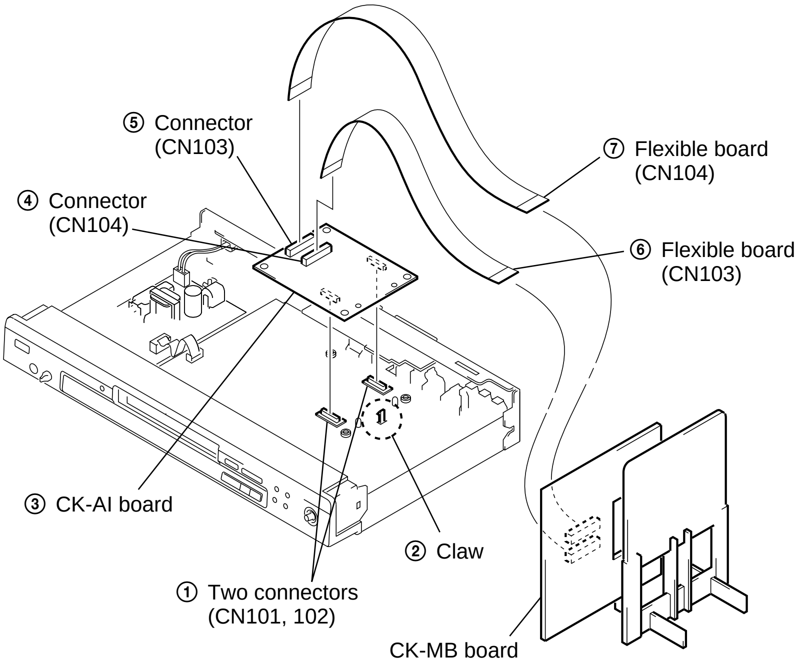


Fig. 5

8) Set the mechanism deck as shown in Fig. 6.

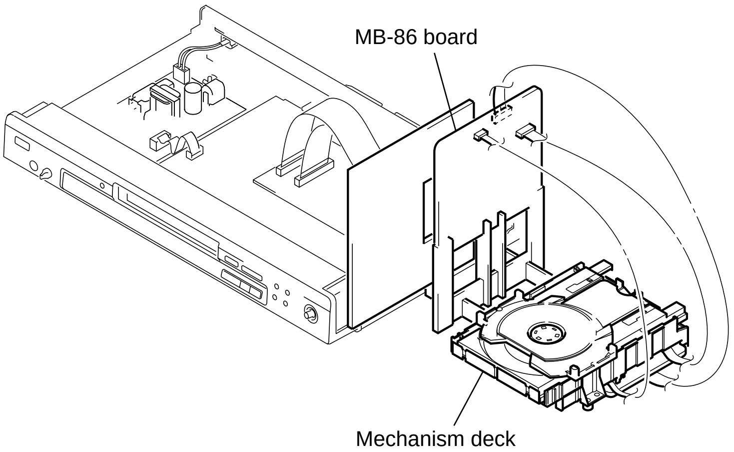


Fig. 6

SECTION 1
GENERAL

This section is extracted from instruction manual (3-063-038-11).

About This Manual

Conventions
- Instructions in this manual describe the controls on the player. You can also use the controls on the remote if they have the same or similar names as those on the player.
- The icons on the right are used in this manual:

Icon	Meaning
(remote icon)	Indicates that you can use only the remote to do the task.
(tip icon)	Indicates tips and hints for making the task easier.
DVD	Indicates that the function is for DVD VIDEOs.
VIDEO CD	Indicates that the function is for VIDEO CDs.
CD	Indicates that the function is for Audio CDs.

This Player Can Play the Following Discs

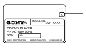
	DVD VIDEOs		VIDEO CDs		Audio CDs	
Disc logo	DVD VIDEO		COMPACT disc DIGITAL VIDEO		COMPACT disc DIGITAL AUDIO	
Contents	Audio + Video		Audio + Video		Audio	
Disc size	12 cm	8 cm	12 cm	8 cm	12 cm	8 cm (CD single)
Play time	About 4 h (for single-sided DVD)/ about 8 h (for double-sided DVD)	About 80 min. (for single-sided DVD)/ about 160 min. (for double-sided DVD)	74 min.	20 min.	74 min.	20 min.

The "DVD VIDEO" logo is a trademark.

This player switches the color system, PAL or NTSC, according to the connected TV. (For details, see page 9.)

Region code of DVDs you can play on this unit

Your DVD player has a region code printed on the back of the unit and will only play DVDs that are labeled with identical region codes.



DVDs labeled (ALL) will also play on this unit.

If you try to play any other DVD, the message "Playback prohibited by area limitations." will appear on the TV screen.

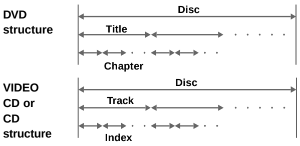
Depending on the DVD, no region code indication may be labeled even though playing the DVD is prohibited by area restrictions.

Note on playback operations of DVDs and VIDEO CDs

Some playback operations of DVDs and VIDEO CDs may be intentionally fixed by software producers. Since this player plays DVDs and VIDEO CDs according to the disc contents the software producers designed, some playback features may not be available. Also refer to the instructions supplied with the DVDs or VIDEO CDs.

Terms for discs

- **Title**
  The longest section of a picture or music feature on a DVD, the movie, etc. in video software, or the name of an album in audio software.
- **Chapter**
  Sections of a picture or a music feature that are smaller than titles. A title is composed of several chapters. Each chapter is assigned a chapter number enabling you to locate the chapter you want. Depending on the disc, no chapters may be recorded.
- **Track**
  Sections of a picture or a music feature on a VIDEO CD or a CD. Each track is assigned a track number enabling you to locate the track you want.



- **Index (CD) / Video Index (VIDEO CD)**
  A number that divides a track into sections to easily locate the point you want on a VIDEO CD or a CD. Depending on the disc, no indexes may be recorded.
- **Scene**
  On a VIDEO CD with PBC (playback control) functions, the menu screens, moving pictures and still pictures are divided into sections called "scenes." Each scene is assigned a scene number enabling you to locate the scene you want.

Note on PBC (Playback Control) (VIDEO CDs)

This player conforms to Ver. 1.1 and Ver. 2.0 of VIDEO CD standards. You can enjoy two kinds of playback according to the disc type.

Disc type	You can
VIDEO CDs without PBC functions (Ver. 1.1 discs)	Enjoy video playback (moving pictures) as well as music.
VIDEO CDs with PBC functions (Ver. 2.0 discs)	Play interactive software using menu screens displayed on the TV screen (PBC Playback), in addition to the video playback functions of Ver. 1.1 discs. Moreover, you can play high-resolution still pictures if they are included on the disc.

Discs that the player cannot play

The player cannot play discs other than the ones listed in the table on page 4. CD-Rs, CD-ROMs including PHOTO CDs, data sections in CD-EXTRAs, DVD-ROMs, DVD-audio, HD (high density) layer of Super Audio CD etc., cannot be played.

When playing DTS*-encoded CDs, excessive noise will be heard from the analog stereo outputs. To avoid possible damage to the audio system, the consumer should take proper precautions when the analog stereo outputs of the DVD player are connected to an amplification system. To enjoy DTS Digital Surround™ playback, an external 5.1-channel DTS Digital Surround™ decoder system must be connected to the digital output of the DVD player.

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

* "DTS," "DTS Digital Surround" and "DTS Digital Out" are trademarks of Digital Theater Systems, Inc.

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Precautions

On safety
- Caution – The use of optical instruments with this product will increase eye hazard.
- Should any solid object or liquid fall into the cabinet, unplug the player and have it checked by qualified personnel before operating it any further.

On power sources
- The player is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the player itself has been turned off.
- If you are not going to use the player for a long time, be sure to disconnect the player from the wall outlet. To disconnect the AC power cord (mains lead), grasp the plug itself; never pull the cord.
- Should the AC power cord (mains lead) need to be changed, have it done at a qualified service shop only.

On placement
- Place the player in a location with adequate ventilation to prevent heat build-up in the player.
- Do not place the player on a soft surface such as a rug that might block the ventilation holes on the bottom.
- Do not place the player in a location near heat sources, or in a place subject to direct sunlight, excessive dust or mechanical shock.

On operation
- If the player is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lenses inside the player. Should this occur, the player may not operate properly. In this case, remove the disc and leave the player turned on for about half an hour until the moisture evaporates.
- When you move the player, take out any discs. If you don't, the disc may be damaged.

On adjusting volume
- Do not turn up the volume while listening to a section with very low level inputs or no audio signals. If you do, the speakers may be damaged when a peak level section is played.

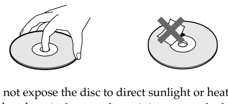
On cleaning
- Clean the cabinet, panel and controls with a soft cloth slightly moistened with a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.

If you have any questions or problems concerning your player, please consult your nearest Sony dealer.

IMPORTANT NOTICE
Caution: The enclosed DVD player is capable of holding a still video image or on-screen display image on your television screen indefinitely. If you leave the still video image or on-screen display image displayed on your TV for an extended period of time you risk permanent damage to your television screen. Projection televisions are especially susceptible to this.

Notes About the Discs

On handling discs
- To keep the disc clean, handle the disc by its edge. Do not touch the surface.
- Do not stick paper or tape on the disc.
  If there is glue (or a similar substance) on the disc, remove the glue completely before using the disc.



- Do not expose the disc to direct sunlight or heat sources such as hot air ducts, or leave it in a car parked in direct sunlight as the temperature may rise considerably inside the car.
- After playing, store the disc in its case.

On cleaning
- Before playing, clean the disc with a cleaning cloth. Wipe the disc from the center out.

- Do not use solvents such as benzine, thinner, commercially available cleaners or anti-static spray intended for vinyl LPs.

On novelty discs
- Do not use irregularly shaped CDs such as heart- or star-shaped CDs as they may cause the player to malfunction.

Getting Started

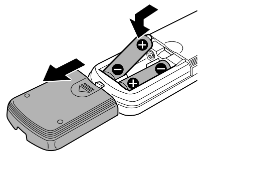
This section describes how to hook up the CD/DVD player to a TV (with audio/video input jacks) and/or an AV receiver (amplifier). You cannot connect this player to a TV which does not have a video input connector. Be sure to turn off the power of each component before making the connections.

Unpacking

Check that you have the following items:
- Audio/video connecting cord (1)
- Remote commander (remote) RMT-D118E (1)
- R6 (size AA) batteries (2)

Inserting batteries into the remote

You can control the player using the supplied remote. Insert two R6 (size AA) batteries by matching the + and – ends on the batteries to the markings inside the compartment. When using the remote, point it at the remote sensor (R) on the player.



Notes
- Do not leave the remote in an extremely hot or humid place.
- Do not drop any foreign object into the remote casing, particularly when replacing the batteries.
- Do not expose the remote sensor to direct sunlight or lighting apparatuses. Doing so may cause a malfunction.
- If you do not use the remote for an extended period of time, remove the batteries to avoid possible damage from battery leakage and corrosion.

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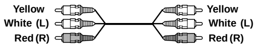
TV Hookups

This connection is for listening to the sound through TV speakers (L:left, R:right). Refer to the instructions supplied with the component to be connected.

You can enjoy surround sound using your TV's built-in speakers
You can use 3D sound imaging to create virtual rear speakers from the sound of built-in TV speakers without using actual speakers (VES TV: Virtual Enhanced Surround TV). For details, see page 35.

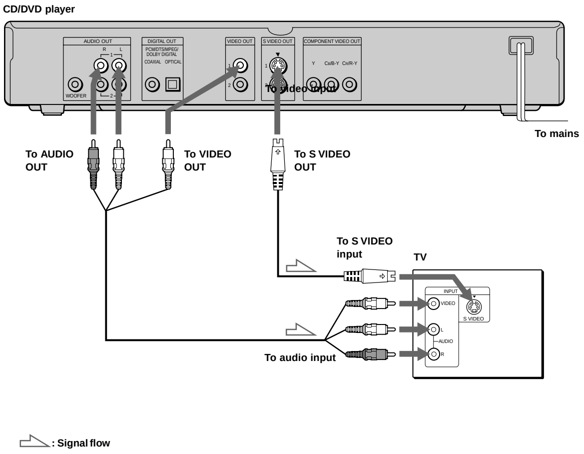
Required cords

Audio/video connecting cord (supplied) (1)

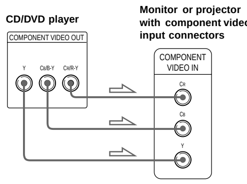


S video cord (not supplied) (1)

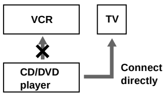
When connecting the cords, be sure to match the color-coded cord to the appropriate jacks on the components: Yellow (video) to Yellow, Red (right) to Red and White (left) to White. Be sure to make connections firmly to avoid hum and noise.
If your TV has an S video input connector, connect the component via the S VIDEO OUT connector using an S video cord (not supplied). You will get a better picture.
Refer to the instructions supplied with the TV to be connected.



If you connect the player to a monitor or projector having component video input connectors that conform to output signals from the COMPONENT VIDEO OUT (Y, CB/B-Y, CR/R-Y) connectors on the player
Connect the component via the COMPONENT VIDEO OUT connectors using three video connecting cords (not supplied) of the same kind. You will get a better picture.



Notes
- Refer to the instructions supplied with the component to be connected.
- Do not connect this player to a video deck. If you do, noise may appear in the picture.



- Depending on the TV or receiver (amplifier), sound distortion may occur because the audio output level is high. In this case, set "AUDIO ATT" in "AUDIO SETUP" to "ON" in the setup display. For details, see page 65.

Setups for the player

Some setup adjustments are necessary for the player depending on the TV or other components to be connected.
Use the setup display to change the various settings.
For details on using the setup display, see page 56.

- **To connect the player to a wide-screen TV**
  In the setup display, set "TV TYPE" in "SCREEN SETUP" to "16:9" (default setting). For details, see page 60.
- **To connect the player to a normal TV**
  In the setup display, set "TV TYPE" in "SCREEN SETUP" to "4:3 LETTER BOX" or "4:3 PAN SCAN." For details, see page 60.
- **If the color system of the TV is NTSC or DUAL**
  Since the color system of the player is set to NTSC, you can use the player as it is.
- **If the color system of the TV is PAL**
  To change the color system of the player to PAL, hold ⓘ down while pressing ❚❚ on the player. The power indicator lights up in green and changes to red. Then release ❚❚.

You can check the color system of the player
Press ⓘ on the player and then press I/⏻ on the remote. The power indicator lights up in green. When "NTSC" appears on the front panel display, the color system of the player is set to NTSC. When "NTSC" does not appear, the color system is set to PAL.

Receiver (Amplifier) Hookups

This connection is for listening to the sound through speakers connected to a receiver without a built-in DTS, Dolby* Digital or MPEG decoder. Refer as well to the instructions supplied with the component to be connected.

You can enjoy surround sounds even if you connect front speakers only
You can use 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers (VES:Virtual Enhanced Surround). For details, see page 35.

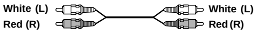
If you have a digital component with a built-in DTS, Dolby Digital or MPEG decoder
You can enjoy multi-channel surround sound by connecting the component via the DIGITAL OUT OPTICAL or COAXIAL connector using an optical or coaxial digital connecting cord (not supplied). For details on hookups and settings, see page 13.

Note
You cannot use the karaoke function with the DIGITAL OUT connectors.

* Manufactured under license from Dolby Laboratories. "Dolby," "Pro Logic" and the double-D symbol are trademarks of Dolby Laboratories.
Confidential unpublished works. ©1992-1997 Dolby Laboratories. All rights reserved.

Required cords

Audio connecting cord (not supplied) (1)

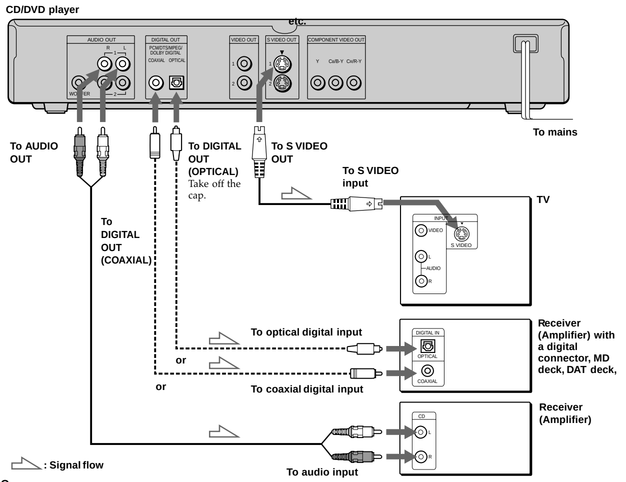


S video cord (not supplied) (1)

When connecting the cords, be sure to match the color-coded cord to the appropriate jacks on the components: Red (right) to Red and White (left) to White. Be sure to make connections firmly to avoid hum and noise.
If you have a digital component such as a receiver (amplifier) with a digital connector, DAT or MD, connect the component via the DIGITAL OUT OPTICAL or COAXIAL connector using an optical or coaxial digital connecting cord (not supplied).

Optical digital connecting cord (not supplied) (1)

Coaxial digital connecting cord (not supplied) (1)



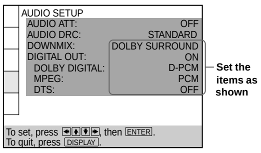
Notes
- You cannot enjoy a picture with an S video signal if your TV does not conform to the S video signal. When your TV does not have an S VIDEO input, connect the component via the VIDEO INPUT connector using the video connecting cord (not supplied) instead of the S video cord. For details, see page 8. Refer to the instructions supplied with your TV.
- Refer to the instructions supplied with the component to be connected.
- You cannot make digital audio recordings of discs recorded in multi-channel surround format directly using an MD deck or DAT deck.
- When you connect the component via the DIGITAL OUT OPTICAL or COAXIAL connector, set Virtual Enhanced Surround (VES) to "OFF." Otherwise, the player will not output the following signals from the DIGITAL OUT OPTICAL or COAXIAL connector.
  – Dolby Digital signals (when you set "DOLBY DIGITAL" in "AUDIO SETUP" to "D-PCM")
  – MPEG audio

When you have made the connections using an optical or coaxial digital connecting cord, do not set "DOLBY DIGITAL" to "DOLBY DIGITAL," "MPEG" to "MPEG" and "DTS" to "ON." If you do, a loud noise will suddenly come out from the speakers, affecting your ears or causing the speakers to be damaged.

Setups for the player

Some setup adjustments are necessary for the player depending on the components to be connected.
Use the setup display to change the various settings.
For details on using the setup display, see page 56.

- **To listen to the sound through speakers connected to a receiver (amplifier) which has a digital connector and lacks a built-in DTS, Dolby Digital or MPEG decoder, or to output the sound to a digital component such as a DAT or MD deck**
  Set the "AUDIO SETUP" items in the setup display (page 65) as shown in the illustration below. These are the default settings.



Set "VES" to "OFF" in the Control Menu display (page 35). When you select any VES mode other than "OFF," no sound will come from the speakers.

Note
When you output the signals which do not reproduce the Dolby Surround (Pro Logic) effect from the DIGITAL OUT OPTICAL or COAXIAL connector, set "DOWNMIX" to "NORMAL" in "AUDIO SETUP" in the setup display (page 65).

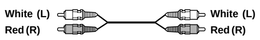
2+1 Channel Surround Hookups

This connection is for listening to the sound through the left and right speakers of the TV, or speakers connected to a receiver and the subwoofer. You can enjoy rich bass frequencies by connecting a subwoofer. Refer to the instructions supplied with the component to be connected.
Set "SUBWOOFER" in "SPEAKER SETUP" to "YES" in the setup display (page 67). Then set "FRONT SPEAKER SIZE" to "TV" when you use the TV's speakers, or to "LARGE," "MIDDLE" or "SMALL" when you use the speakers connected to the receiver.

You can enjoy surround sounds even if you connect front speakers only
You can use 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers (Virtual Enhanced Surround). For details, see page 35.

Required cords

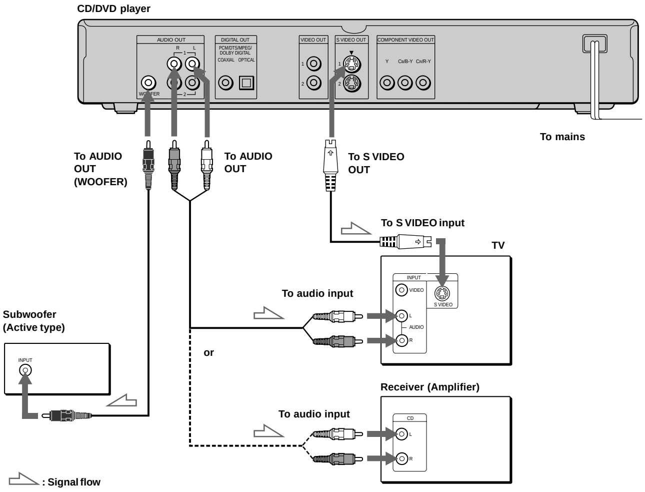
Audio connecting cord (not supplied) (1)



S video cord (not supplied) (1)

Monaural audio cord (not supplied) (1)
One for a subwoofer

When connecting the cords, be sure to match the color-coded cord to the appropriate jacks on the components: Red (right) to Red and White (left) to White. Be sure to make connections firmly to avoid hum and noise.



Notes
You cannot enjoy a picture with an S video signal if your TV does not conform to the S video signal. When your TV does not have an S VIDEO input, connect the component via the VIDEO INPUT connector using the video connecting cord (not supplied) instead of the S video cord. For details, see page 8.
Refer to the instructions supplied with your TV.

5.1 Channel Surround Hookups

With DVDs which contain DTS, Dolby Digital or MPEG audio sound, you can enjoy the surround sound while producing the effect of being in a movie theater or a concert hall using a digital component with a built-in DTS, Dolby Digital or MPEG decoder (not supplied). The player outputs the surround sound signals from the DIGITAL OUT OPTICAL and COAXIAL connectors. Using a receiver (amplifier) having the OPTICAL or COAXIAL connector and 6 speakers, you can enjoy even greater real audio presence in the comfort of your own home.

Notes
- When a DVD has a sound track with 7.1 channels recorded in MPEG audio format, the output audio signals are mixed down to 5.1 channels.
- You cannot use the karaoke function with the DIGITAL OUT connectors.

Required cords

Optical digital connecting cord* (not supplied) (1)

Coaxial digital connecting cord* (not supplied) (1)

S video cord (not supplied) (1)

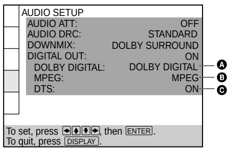
* Connect the component via the DIGITAL OUT OPTICAL or COAXIAL connector using an optical or coaxial digital connecting cord (not supplied). You do not need to connect both of these cords. See the figure on the next page.

Notes
- Do not connect the mains lead to mains or press the POWER switch before completing all connections.
- Refer to the instructions supplied with the component to be connected.
- The cord connectors should be fully inserted into the jacks. A loose connection may cause hum and noise.

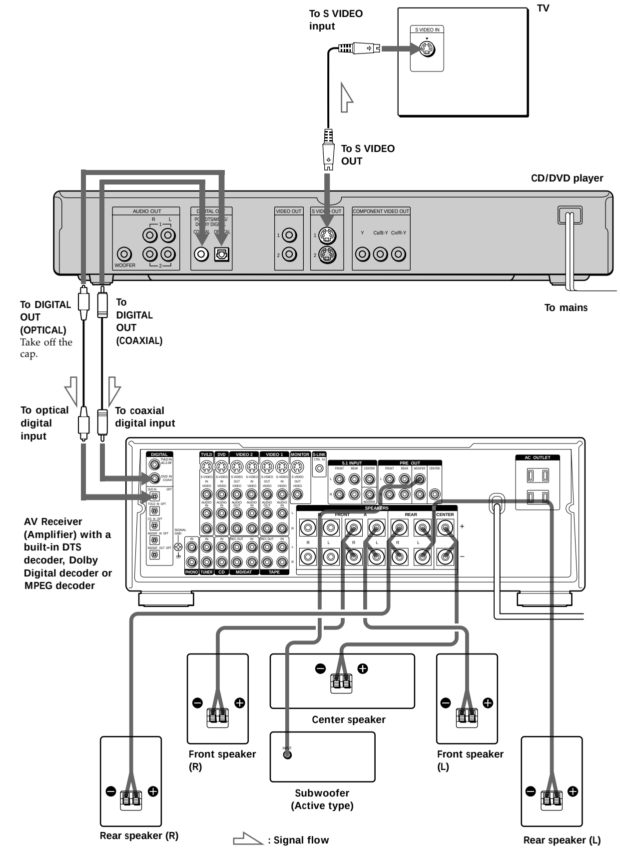
Setups for the player

Some setup adjustments are necessary for the player depending on the components to be connected.
Use the setup display to change the various settings.
For details on using the setup display, see page 56.

- **When you connect an audio component with a built-in Dolby Digital decoder Ⓐ**
  Set "DIGITAL OUT" in "AUDIO SETUP" to "ON" and then set "DOLBY DIGITAL" to "DOLBY DIGITAL" in the setup display. (page 65)
- **When you connect an audio component with a built-in MPEG decoder Ⓑ**
  Set "DIGITAL OUT" in "AUDIO SETUP" to "ON" and then set "MPEG" to "MPEG" in the setup display. (page 65)
- **When you connect an audio component with a built-in DTS decoder Ⓒ**
  Set "DIGITAL OUT" in "AUDIO SETUP" to "ON" and then set "DTS" to "ON" in the setup display. (page 65)

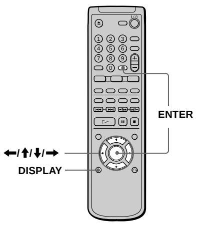


Notes
- **When you do not connect an audio component with a built-in Dolby Digital decoder, do not set "DOLBY DIGITAL" to "DOLBY DIGITAL."**
- **When you do not connect an audio component with a built-in MPEG decoder, do not set "MPEG" to "MPEG."**
- **When you do not connect an audio component with a built-in DTS decoder, do not set "DTS" to "ON."**

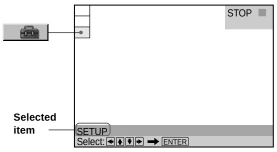


Selecting the Language for the On-Screen Display

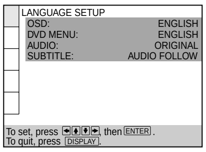
You can select the language for the setup display, the Control Menu display or the messages displayed on the screen. The default setting is "ENGLISH."



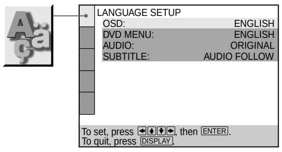
1 When the player is in stop mode, press DISPLAY and select "SETUP" using ↑/↓.
The on-screen menu items are different depending on whether there is a disc in the player or not.



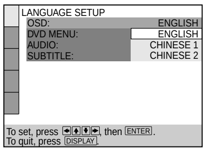
2 Press ENTER.
The setup display appears on the TV screen.



3 Select "LANGUAGE SETUP" using ↑/↓, and then press ENTER.



4 Select "OSD" using ↑/↓, then press → or ENTER.
The languages you can select are displayed.



5 Select the desired language using ↑/↓, then press ENTER.

6 Press DISPLAY.
The setup display disappears.

7 Press DISPLAY repeatedly to turn off the on-screen menu.

To return to the previous screen
Press RETURN.

To quit while making a selection
Press DISPLAY.

Note
The languages you can select are the ones displayed in step 4.
For details, see page 59.

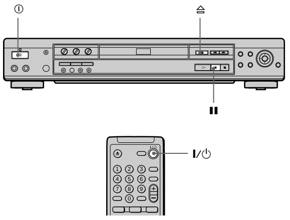
Operation Sound Effects (Sound Feedback)

The player beeps when the following operations are performed.
The default setting of the Sound Feedback function is set to off.

Operation	Operation sound
Power is turned on	One beep
Power is turned off	Two beeps
▷ is pressed	One beep
❚❚ is pressed	Two beeps
Playback is stopped	One long beep
Operation is not possible	Three beeps

In karaoke mode, the player beeps when the following operations are performed using buttons on the player or on the remote. For details about the karaoke operations, see page 45.

Operation	Operation sound
When you turn the karaoke mode on	One beep
When you turn the karaoke mode off	Two beeps
When you turn on: KARAOKE PON, VOCAL, VOCAL SUPPORT	One beep
When you turn off: KARAOKE PON, KARAOKE STAR, VOCAL, VOCAL SUPPORT	Two beeps
KEY CONTROL:	
♮	Two beeps
♯ at the maximum	Three beeps
♭ at the minimum	Three beeps
VOCAL SELECT (for DVDs):	
1+2	Two beeps
1	One beep
2	One beep
VOCAL SELECT (for CDs/VIDEO CDs/Super VCDs):	
L+R	Two beeps
STEREO	One beep
RESERVE:	
When the player waits for the next disc	Two beeps after one long beep (stop)
When all reserved titles or tracks are finished	One long beep (stop)
EFFECT MODE:	
OFF	Two beeps
1, 2	One beep



1 Press ⏻ on the player, then press I/⏻ on the remote.
The power indicator lights up in green.
When there is a disc in the player, press ⏏ and remove the disc. Then press ⏏ again to close the disc tray.

2 Press and hold ❚❚ on the player for more than two seconds.
You will hear one beep and the Sound Feedback function is turned on.

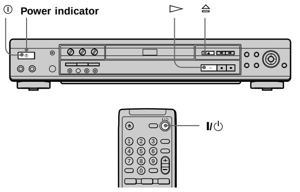
To turn off the Sound Feedback Function
When there is no disc in the player, press and hold ❚❚ on the player for more than two seconds. You will hear two beeps and the Sound Feedback function is turned off.

Playing Discs

This chapter describes how to play a DVD/CD/VIDEO CD.

Playing Discs DVD VIDEO CD CD

Depending on the DVD or VIDEO CD, some operations may be different or restricted. Refer to the instructions supplied with your disc.

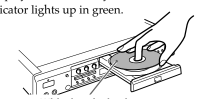


1 Turn on your TV.
Turn on the TV and select the video input so that you can view the pictures from this player.

When using a receiver (amplifier)
Turn on the receiver (amplifier) and select the appropriate position so that you can listen to the sound from this player.

2 Press ⏻ on the player.
The player enters standby mode and the power indicator lights up in red.

3 Press ⏏ on the player, and place a disc on the disc tray.
The player automatically turns on and the power indicator lights up in green.


With the playback side facing down

4 Press ▷.
The disc tray closes and the player starts playback (continuous play). Adjust the volume on the TV or the receiver (amplifier).

After following Step 4
■ When playing a DVD
A DVD menu or title menu may appear on the TV screen (see page 21).
■ When playing a VIDEO CD
A menu may appear on the TV screen depending on the VIDEO CD. You can play the disc interactively, following the instructions on the menu. (PBC Playback, see page 22.)

To turn on the player
Press ⏻ on the player. The player enters standby mode and the power indicator lights up in red.
Then press I/⏻ on the remote. The player turns on and the power indicator lights up in green. In standby mode, the player also turns on by pressing ⏏ on the player or by pressing ▷.

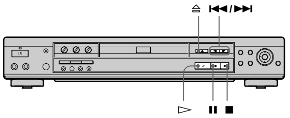
To turn off the player
Press I/⏻ on the remote. The player enters standby mode and the power indicator lights up in red.
To disconnect the power of the player, press ⏻ on the player.

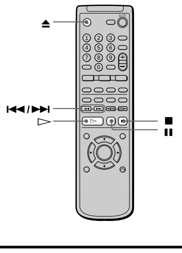
Notes on playing DTS sound tracks on a CD
- Do not play DTS sound tracks without first connecting the player to an audio component having a built-in DTS decoder. The player outputs the DTS signal via the DIGITAL OUT OPTICAL and COAXIAL connectors even if “DTS” in “AUDIO SETUP” is set to “OFF” in the setup display, and may affect your ears or cause your speakers to be damaged.
- Set the sound to “STEREO” when you play DTS sound tracks on a CD. (See “Changing the Sound” on page 31.) If you set the sound to “1/L” or “2/R,” no sound will come from the DIGITAL OUT OPTICAL and COAXIAL connectors.
- If you play a CD with a DTS sound track, a loud noise may come out from the AUDIO OUT connectors, affecting your ears or causing the speakers to be damaged.

Notes on playing DTS sound tracks on a DVD
The signals of the DTS sound tracks are output from the DIGITAL OUT OPTICAL and COAXIAL connectors only. No sound will be output from the AUDIO OUT connectors.
- If the player is connected to an audio component lacking a built-in DTS decoder, do not set “DTS” in “AUDIO SETUP” to “ON” in the setup display. Otherwise, when you play the DTS sound track, a loud noise will come out from the speakers, affecting your ears or causing the speakers to be damaged.
- When you set “DTS” in “AUDIO SETUP” to “OFF,” no sound will come out from the DIGITAL OUT OPTICAL and COAXIAL connectors even if you play DTS sound tracks on DVDs.

Notes
- If you leave the player or the remote in pause or stop mode for 15 minutes, the screen saver image appears automatically. It will also appear if you play back a CD for more than 15 minutes. To make the screen saver image go away, press ▷. (If you want to set the screen saver function to off, see page 60.)
- If you don’t operate the player or the remote for more than 30 minutes when a disc is not being played, the player automatically enters standby mode. (Auto Power Off function)
- While playing a disc, do not turn off the player by pressing ⏻. Doing so may cancel the settings of the menu. When you turn off the player, press ■ first to stop playback and then press I/⏻ on the remote. After the power indicator lights up in red and the player enters standby mode, press ⏻ on the player.

Additional operations



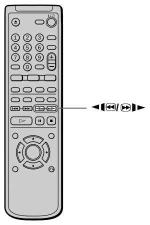


To	Operation
Stop	Press ■
Pause	Press ❚❚
Resume play after pause	Press ❚❚ or ▷
Go to the next chapter, track or scene in continuous play mode	Press ⏭
Go back to the preceding chapter, track or scene in continuous play mode	Press ⏮
Stop play and remove the disc	Press ⏏

You can play discs in various modes such as Program Play using the on-screen menu (Control Menu). For Control Menu operations, see page 25.

Searching for a Particular Point on a Disc DVD VIDEO CD CD

You can locate a particular point on a disc quickly by monitoring the picture or playing back slowly.



Note
Depending on the DVD/VIDEO CD, you may not be able to do some of the operations described.

Locating a point quickly by playing a disc in fast forward or fast reverse (Scan)

While a disc is playing, press II▶ to locate a point in playback direction, or press ◀II to locate a point in opposite direction. When you find the point you want, press ▷ to return to normal speed playback.
Each time you press the ◀II or II▶ button during scan, the playback speed changes. Three speeds are available. With each press, the display changes as follows:

Playback direction
x2▶ (DVD/CD only) → FF1▶▶ → FF2▶▶

Opposite direction
x2◀ (DVD only) → FR1◀◀ → FR2◀◀

The x2▶/x2◀ playback speed is about twice the normal speed.
The FF2▶▶/FR2◀◀ playback speed is faster than FF1▶▶/FR1◀◀.

Locating a point slowly by watching the screen (Slow-motion play) DVD VIDEO CD

You can use this function only for DVDs or VIDEO CDs.
When the player is in the pause mode, press II▶ to locate a point in playback direction, or press ◀II to locate a point in opposite direction. When you find the point you want, press ▷ to return to the normal speed playback.
Each time you press the ◀II or II▶ button during Slow-motion play, the playback speed changes. Two speeds are available. With each press, the indication changes as follows:

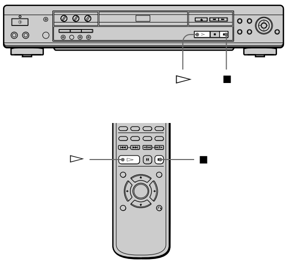
Playback direction
SLOW1I▶ ←→ SLOW2I▶

Opposite direction (DVD only)
SLOW1◀I ←→ SLOW2◀I

The SLOW2I▶/SLOW2◀I playback speed is slower than SLOW1I▶/SLOW1◀I.

Resuming Playback from the Point Where You Stopped the Disc (Resume Play) DVD VIDEO CD CD

The player remembers the point where you stopped the disc and when "RESUME" appears on the front panel display, you can resume playback from that point.
As long as you do not open the disc tray, Resume Play will work even if the player enters standby mode by pressing I/⏻ on the remote.



1 While playing a disc, press ■ to stop playback.
"RESUME" appears on the front panel display and "Disc will restart from current point. To start from beginning, press STOP again." appears on the TV screen.
If "RESUME" does not appear, Resume Play is not available.

2 Press ▷.
The player starts playback from the point where you stopped the disc in Step 1.

To play from the beginning of the disc
When the playing time appears on the front panel display before you start playing, press ■ to reset the playing time, then press ▷.

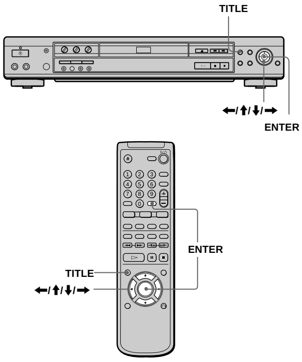
Notes
- Resume Play may not be available on some DVDs.
- Resume Play is not available in Shuffle or Program Play mode.
- Depending on where you stopped the disc, the player may resume playback from a different point.
- The point where you stopped playing is cleared when:
  - you open or close the disc tray
  - you turn the power off by pressing ⏻ on the player
  - you change the play mode
  - you start playback after selecting a title, chapter or track
  - you change the settings in the setup display

Using the DVD's Menu DVD

Some DVDs have a title menu or a DVD menu that is provided with DVDs only.

Using the title menu

A DVD is divided into long sections of a picture or a music feature called "titles." When you play a DVD which contains several titles, you can select the title you want using the title menu.



1 Press TITLE.
The title menu appears on the TV screen. The contents of the menu vary from disc to disc.

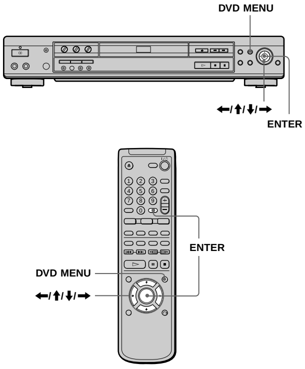
2 Press ←/↑/↓/→ to select the title you want to play.
Depending on the disc, you can use the number buttons to select the title.

3 Press ENTER.
The player starts playing the selected title.

Notes
- On some DVDs, you may not be able to select the title.
- On some DVDs, a "title menu" may simply be called a "menu" or "title" in the instructions supplied with the disc. "Press ENTER." may also be expressed as "Press SELECT."

Using the DVD menu

Some DVDs allow you to select the disc contents using a menu. When you play these DVDs, you can select the language for the subtitles, the language for the sound, etc., using the DVD menu.



1 Press DVD MENU.
The DVD menu appears on the TV screen. The contents of the menu vary from disc to disc.

2 Press ←/↑/↓/→ to select the item you want to change.
Depending on the disc, you can use the number buttons to select the item.

3 To change other items, repeat Step 2.

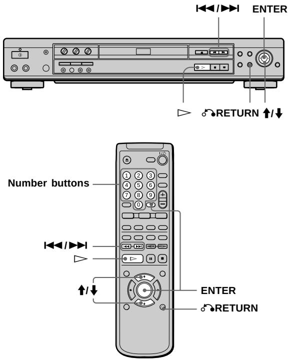
4 Press ENTER.

If you want to select the language for the DVD menu
Change the setting using "DVD MENU" in "LANGUAGE SETUP" in the setup display. For details, see page 59.

Note
Depending on the DVD, a "DVD menu" may simply be called a "menu" in the instructions supplied with the disc.

Playing VIDEO CDs with PBC Functions (PBC Playback) VIDEO CD

When playing VIDEO CDs with PBC (Play Back Control) functions (Ver. 2.0 discs), you can enjoy simple interactive operations, search functions, and other such operations.
PBC Playback allows you to play VIDEO CDs interactively by following the menu on the TV screen.
On this player, you can use the number buttons, ENTER, I◀◀, ▶▶I, ↑/↓ and ↶RETURN during PBC Playback.



1 Start playing a VIDEO CD with PBC functions by following Steps 1 to 4 in "Playing Discs" on page 17.

2 Select the item number you want.
Press ↑/↓ to select the item number.
You can also select the item number with the number buttons on the remote.

3 Press ENTER.

4 Follow the instructions in the menu for interactive operations.
Refer to the instructions supplied with the disc, as the operating procedure may differ according to the VIDEO CD.

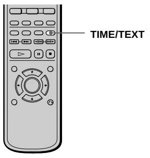
To go back to the menu
Press ↶RETURN, I◀◀, or ▶▶I.

To cancel PBC playback of a VIDEO CD with PBC functions and play the disc in continuous play mode
There are two ways.
- Before you start playing, select the track you want using I◀◀ or ▶▶I, then press ENTER or ▷.
- Before you start playing, select the track number using the number buttons on the remote, then press ENTER or ▷.
  "Play without PBC." appears on the TV screen and the player starts continuous play. You cannot play still pictures such as a menu.
  To return to PBC playback, press ■ twice then press ▷.

Notes
- Depending on the VIDEO CD, "Press ENTER" in Step 3 may be expressed as "Press SELECT" in the instructions supplied with the disc. In this case, press ▷.
- The PBC functions of Super VCDs do not work with this player. Super VCDs are played in continuous play mode only.

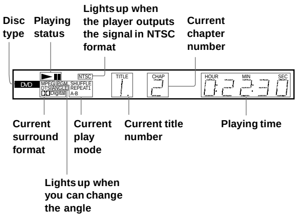
Using the Front Panel Display DVD VIDEO CD CD

You can check information about the disc, such as the total number of titles or tracks or remaining time, using the front panel display.

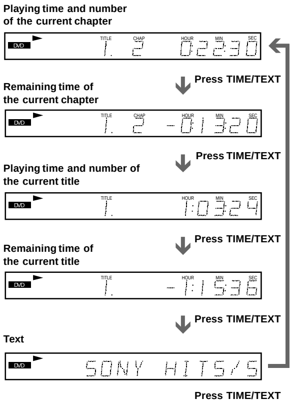


When playing back a DVD DVD

Displaying information while playing the disc



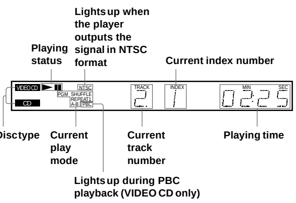
Checking the remaining time
Press TIME/TEXT.
Each time you press TIME/TEXT while playing the disc, the display changes as shown in the following chart.



Notes
- On some DVDs, the chapter number or time may not appear or you may not be able to change the front panel display.
- While you are doing Shuffle Play or Program Play, the playing time of the title and the remaining time of the title are not displayed.

When playing back a CD/VIDEO CD VIDEO CD CD

Displaying information while playing a disc



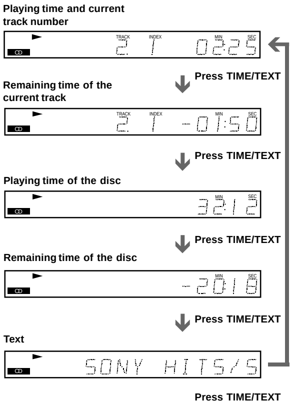
When playing VIDEO CDs with PBC functions

The current scene number is displayed instead of the current track number and the current index number. In this case, the front panel display does not change when you press TIME/TEXT. If TEXT is recorded on the disc, the front panel display changes to the Text display when you press TIME/TEXT (see page 30).

Checking the remaining time

Press TIME/TEXT.

Each time you press TIME/TEXT while playing a disc, the display changes as shown in the following chart.



Note

While you are doing Shuffle Play, or Program Play, the playing time of the disc and the remaining time of the disc are not displayed.

Using Various Functions with the Control Menu

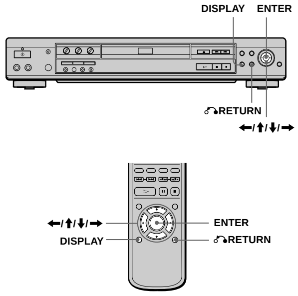
This chapter describes how to play discs in various modes and how to use the convenient features of the on-screen menu (Control Menu).

Using the Control Menu Display DVD VIDEO CD CD

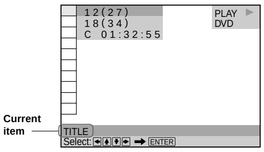
Using the Control Menu display, you can select the starting point, play scenes in any order you like, change the viewing angles, make Digital Cinema Sound settings, and other such operations.

The possible operations are different depending on the kind of disc.

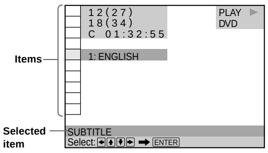
For details on each Control Menu display item, see pages 28 to 44.



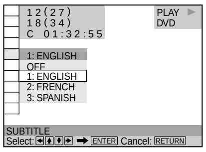
1 Press DISPLAY to show the Control Menu display on the TV screen.



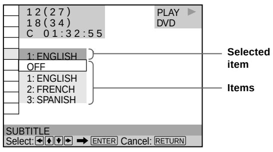
2 Select the item you want using ↑/↓.



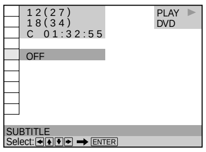
3 Press ENTER.



4 Select the item you want using ↑/↓.



5 Press ENTER.



To cancel while making a selection

Press RETURN.

To display other items

Each time you press DISPLAY, the Control Menu display changes as follows:

Control Menu display 1
↓
Control Menu display 2 (DVD only)
(The items except the first three items from the top are changed to other items.)
↓
Karaoke Control Menu display
(The Karaoke Control Menu display items can be used only when the player is in karaoke mode. For details, see page 47.)
↓
ADVANCED display (page 36)
↓
Control Menu display off

The Control Menu display items are different depending on the disc.

You can select some items directly

Some items can be selected by pressing the corresponding button on the remote. In this case, only the item you selected is displayed. For instructions on using the remote, see the pages of each relevant item.

Note

Some Control Menu display items require operations other than selecting the setting. For details on these items, see the relevant pages.

Control Menu Item List

TITLE (DVD only) (page 28)/
SCENE (VIDEO CD during PBC playback only) (page 28)/
TRACK (VIDEO CD only) (page 28)

CHAPTER (DVD only) (page 28)/
INDEX (VIDEO CD only) (page 28)

TRACK (CD only) (page 28)

INDEX (CD only) (page 28)

You can search for a point on the disc by selecting the title, chapter, track, index or scene.

TIME/TEXT (pages 29, 30)

You can check the playing time and remaining time of the current title, chapter, track and the total playing time or remaining time of the disc.

You can also search by inputting the time code.

You can check the DVD TEXT or CD TEXT of the disc on the TV screen and the front panel display.

AUDIO (page 31)

If the DVD is recorded with multilingual tracks, you can select the language you want while playing the DVD.

If the DVD is recorded in multiple audio formats (PCM, Dolby Digital, MPEG or DTS), you can select the audio format you want while playing the DVD.

With CDs or VIDEO CDs, you can select the sound from the right or left channel and listen to the sound of the selected channel through both the right and left speakers.

SUBTITLE (DVD only) (page 33)

With DVDs on which multilingual subtitles are recorded, you can change the subtitle language whenever you want while playing the DVD, and turn it on or off whenever you want.

ANGLE (DVD only) (page 34)

With DVDs on which various angles (multi-angles) are recorded, you can change the angle of the scene.

VES (DVD only) (page 35)

Select a mode to enjoy multichannel surround sound such as Dolby Digital and MPEG.

Even if you connect only front speakers, Virtual Enhanced Surround (VES) lets you enjoy 3D sound by using 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers.

ADVANCED (DVD only) (page 36)

You can check play information about the bit rate or the position where the disc is being played (layer).

CUSTOM PARENTAL CONTROL (page 37)

Using a registered password, you can set playback restrictions for a desired disc.

The same password is used for both Parental Control (page 62) and Custom Parental Control.

SETUP (page 56)

Using the setup display, you can do the initial setup, adjust the picture and sound and set the various outputs. You can also set a language for the subtitles and the setup display, limit playback by children, and so on. For details about the setup display, see page 56.

PROGRAM (page 39)

You can play the contents of the disc in the order you want by arranging the order of the titles, chapters or tracks on the disc to create your own program.

SHUFFLE (page 41)

You can have the player "shuffle" titles, chapters or tracks and play them in a random order. Subsequent "shuffling" may produce a different playing order.

REPEAT (page 42)

You can play all the titles/tracks on a disc or a single title/chapter/track repeatedly.

A-B REPEAT (page 43)

You can play a specific portion of a title, chapter, or track repeatedly.

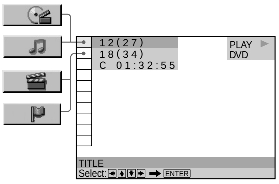
For details about the Karaoke Control Menu display, see "Using the Karaoke Control Menu Display" on page 47.

Searching for a Title/Chapter/Track/Index/Scene

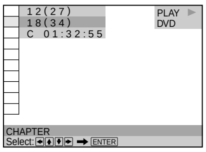
DVD VIDEO CD CD

You can search the disc by title, chapter, track, index or scene.

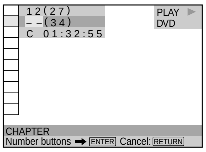
Select "TITLE," "CHAPTER," "TRACK," "INDEX" or "SCENE" after pressing DISPLAY.
When you play back a DVD, "TITLE" and "CHAPTER" are displayed.
When you play back a VIDEO CD/CD, "TRACK" and "INDEX" are displayed. When you play back a VIDEO CD with PBC functions, "SCENE" is displayed.



1 **Select "TITLE," "CHAPTER," "TRACK," "INDEX" or "SCENE" using ↑/↓.**
"✻✻ (✻✻)" is highlighted. (✻✻ refers to a number)
The number in parentheses indicates the total number of titles, chapters, tracks, indexes or scenes.



2 **Press → or ENTER.**
"✻✻ (✻✻)" changes to "– – (✻✻)."



3 **Select the number of the title, chapter, track, index or sceneyou want to search for using the number buttons, then pressENTER.**
The player starts playback at the selected number.
To cancel the number, press CLEAR before pressing ENTER.

To cancel while making a selection
Press RETURN.

You can search for the title, chapter, track, index or scene using the SEARCH MODE button
1 Press SEARCH MODE on the remote repeatedly to select "TITLE," "CHAPTER," "TRACK," "INDEX" or "SCENE."
2 Press number buttons to select the number of the title, chapter, track, index or scene, then press ENTER.

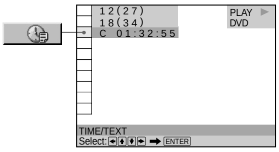
Notes
- The title, chapter or track number displayed is the same number recorded on the disc.
- The index numbers are not displayed during PBC playback of VIDEO CDs.

Checking the Playing Time and Remaining Time

DVD VIDEO CD CD

You can check the playing time and remaining time of the current title, chapter or track and the total playing time or remaining time of the disc.

Press DISPLAY. Then press TIME/TEXT on the remote to change the time information.
You can also check the DVD TEXT or CD TEXT. See page 30.



When playing a DVD
■ TIME/TEXT
- C ✻✻:✻✻:✻✻: Playing time of the current chapter
- C –✻✻:✻✻:✻✻: Remaining time of the current chapter
- T ✻✻:✻✻:✻✻: Playing time of the current title
- T –✻✻:✻✻:✻✻: Remaining time of the current title

When playing a VIDEO CD (during PBC playback)
■ TIME/TEXT
- ✻✻:✻✻: Playing time of the current scene

When playing a VIDEO CD (in continuous play) or CD
■ TIME/TEXT
- T ✻✻:✻✻: Playing time of the current track
- T –✻✻:✻✻: Remaining time of the current track
- D ✻✻:✻✻: Playing time of the current disc
- D –✻✻:✻✻: Remaining time of the current disc

When playing a Super VCD
The remaining time cannot be displayed.
■ TIME/TEXT
- T ✻✻:✻✻: Playing time of the current track

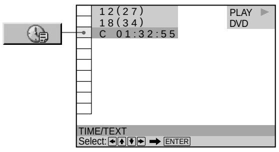
You can select "TIME/TEXT" directly
Press TIME/TEXT on the remote. Each time you press the button, the time information changes.

Selecting a Starting Point Using the Time Code

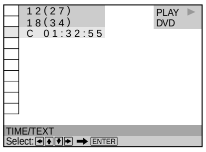
DVD

You can search for a starting point by inputting the time code.

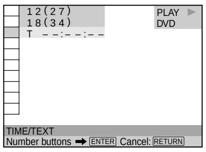
Select "TIME/TEXT" after pressing DISPLAY.
The time code corresponds to the approximate actual playing time. For example, to search for a scene 2 hours 10 minutes 20 seconds past the beginning, input 2:10:20.



1 **Select "C✻✻:✻✻:✻✻" (playing time of the current chapter) when playing a DVD.**



2 **Press → or ENTER.**
Time code changes to "T– – : – – : – –."



Selecting a Starting Point Using the Time Code

3 **Input the time code using the number buttons, then pressENTER.**
The player starts playback at the selected time colde.
To cancel the number, press CLEAR before pressing ENTER.

To cancel while making a selection
Press RETURN.

You can perform time code search using the SEARCH MODE button
1 Press SEARCH MODE on the remote repeatedly to select "TIME/TEXT."
2 Input the time code using the number buttons, then press ENTER.

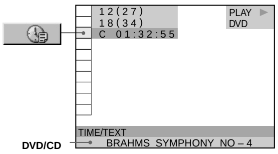
Note
When you input the time code, input the playing time of the title, not the chapter or track time.

Viewing the Disc Information

DVD VIDEO CD CD

You can check the DVD TEXT or CD TEXT of the disc on the TV screen and the front panel display.
DVD TEXT and CD TEXT are information recorded on the disc which you cannot change.

Press DISPLAY. Then press TIME/TEXT on the remote until DVD/CD TEXT is displayed.
The information is displayed at the bottom of the display.



DVD/CD TEXT

You can select "TIME/TEXT" directly
Press TIME/TEXT on the remote. To display DVD/CD TEXT, press TIME/TEXT until DVD/CD TEXT is displayed.

You can view the entire DVD/CD TEXT recorded on the disc
DVD/CD TEXT is scrolled on the front panel display.

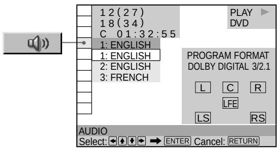
Notes
- DVD TEXT is displayed only in English.
- "NO TEXT" appears when the DVD/CD TEXT is not recorded on the disc.
- This player can only display the first level of DVD/CD TEXT information.

Changing the Sound

DVD VIDEO CD CD

If the DVD is recorded with multilingual tracks, you can select the language you want while playing the DVD.
If the DVD is recorded in multiple audio formats (PCM, Dolby Digital, MPEG or DTS), you can select the audio format you want while playing the DVD.
With CDs or VIDEO CDs, you can select the sound from the right or left channel and listen to the sound of the selected channel through both the right and left speakers. In this case, the sound loses its stereo effect. For example, with a disc containing a song, the right channel may output the vocals and the left channel may output the instrumental. If you only want to hear the instrumental, you can select the left channel and hear it from both speakers.

Select "AUDIO" after pressing DISPLAY.



■ AUDIO
When playing a DVD
Select the language. The languages you can select are different depending on the DVD. When 4 digits are displayed, they represent the language code. Select the language code from the list on page 75.
When the same language is displayed two or more times, the DVD is recorded in multiple audio formats. The current audio format is shown on the "PROGRAM FORMAT" display.

When playing a VIDEO CD or a CD
The default setting is underlined.
- <u>STEREO</u>: The standard stereo sound
- 1/L: The sound of the left channel (monaural)
- 2/R: The sound of the right channel (monaural)

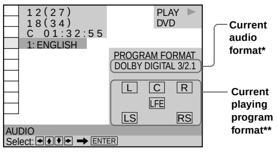
When playing a Super VCD
The default setting is underlined.
- <u>1:STEREO</u>: The stereo sound of the audio track 1
- 1:1/L: The sound of the left channel of the audio track 1 (monaural)
- 1:2/R: The sound of the right channel of the audio track 1 (monaural)
- 2:STEREO: The stereo sound of the audio track 2
- 2:1/L: The sound of the left channel of the audio track 2 (monaural)
- 2:2/R: The sound of the right channel of the audio track 2 (monaural)

You can select "AUDIO" directly
Press AUDIO on the remote. Each time you press the button, the item changes.

Notes
- Depending on the DVD, you may not be able to change the languages even if multilingual tracks are recorded on the DVD.
- While playing the CD/VIDEO CD, standard stereo playback will be resumed when:
  – you open or close the disc tray
  – the player enters standby mode by pressing I/⏻ on the remote
  – you turn the power off by pressing ⏻ on the player
- While playing the DVD, the sound may be changed when:
  – you open or close the disc tray
  – you change the title
- If "DTS" is set to "OFF" in "AUDIO SETUP," the DTS track selection option will not appear on the screen even if the disc contains DTS tracks.
- While playing the Super VCD on which the audio track 2 is not recorded, no sound will come out when you select "2:STEREO," "2:1/L" or "2:2/R."

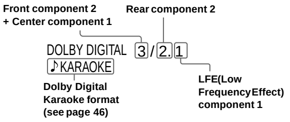
Displaying the audio information of the disc DVD

When you select "AUDIO," the channels being played are displayed on the screen.
In Dolby Digital format, multiple signals ranging from monaural to 5.1 channel signals can be recorded on a DVD. Depending on the DVD, the number of the recorded channels may be different.



* "PCM," "DTS," "DOLBY DIGITAL" or "MPEG" is displayed. In case of "DOLBY DIGITAL," the channels in the playing track are displayed by numbers as follows:

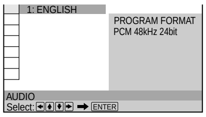
For Dolby Digital 5.1 ch:



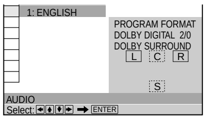
** The letters in the program format display mean the following:
- L: Front (left)
- R: Front (right)
- C: Center (monaural)
- LS: Rear (left)
- RS: Rear (right)
- S: Rear (monaural) – the rear component of the Dolby Surround processed stereo signal and the Dolby Digital signal.
- LFE: – LFE (Low Frequency Effect)

The display examples are as follows:

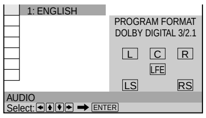
•PCM (stereo)



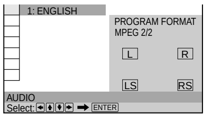
•Dolby Surround



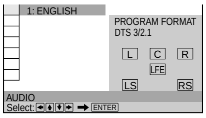
•Dolby Digital 5.1ch
"LFE" appears only when a disc contains an LFE signal component. "LFE" remains on the "PROGRAM FORMAT" display even if the LFE signal component is not being output.



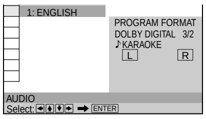
•MPEG



•DTS
"LFE" is always enclosed in a solid line regardless of the LFE signal component being output.



•Dolby Digital Karaoke format
(For details, see page 46.)

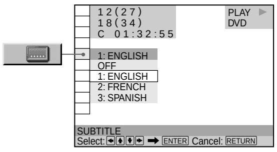


Note
When the signal does not contain rear signal components such as LS, RS or S, the Virtual Enhanced Surround (VES) effect cannot be heard (page 35).

Displaying the Subtitles DVD

With DVDs on which subtitles are recorded, you can turn the subtitles on and off whenever you want while playing the DVD.
With DVDs on which multilingual subtitles are recorded, you can change the subtitle language whenever you want while playing the DVD, and turn it on or off whenever you want. For example, you can select the language you want to practice and turn the subtitles on for better understanding.

Select "SUBTITLE" after pressing DISPLAY.



■ **SUBTITLE**
Select the language. The languages you can select are different depending on the DVD. When 4 digits are displayed, they indicate the language code. Select the language code from the list on page 75.

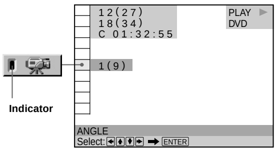
You can select "SUBTITLE" directly
Press SUBTITLE on the remote. Each time you press the button, the item changes.

Notes
- When playing a DVD on which no subtitles are recorded, no subtitles appear.
- Depending on the DVD, you may not be able to turn the subtitles on even if they are recorded on the DVD.
- Depending on the DVD, you may not be able to turn the subtitles off.
- The type and number of languages for subtitles vary from disc to disc.
- Depending on the DVD, you may not be able to change the subtitles even if multilingual subtitles are recorded on it.
- While playing the DVD, the subtitle may change when:
  – you open or close the disc tray
  – you change the title

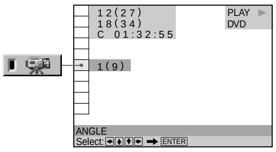
Changing the Angles DVD

With DVDs on which various angles (multi-angles) for a scene are recorded, you can change the angles. For example, while playing a scene of a train in motion, you can display the view from either the front of the train, the left window of the train or from the right window without having the train's movement interrupted.

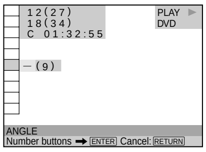
Select "ANGLE" after pressing DISPLAY. When the angles can be changed, the "ANGLE" indicator lights up in green.



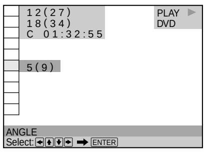
1 **Select "ANGLE."**



2 **Press ➡.**
The number of the angle changes to "–." The number in parentheses indicates the total number of angles.



3 **Select the angle number using the number buttons or ⬆/⬇, then press ENTER.**
The angle is changed to the selected angle.



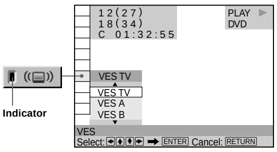
You can select "ANGLE" directly
Press ANGLE on the remote. Each time you press the button, the angle changes.

Notes
- The number of angles varies from disc to disc or from scene to scene. The number of angles that can be changed on a scene is equal to the number of angles recorded for that scene.
- Depending on the DVD, you may not be able to change the angles even if multi-angles are recorded on the DVD.

Digital Cinema Sound Settings DVD

Select a mode to enjoy multichannel surround sound such as Dolby Digital and MPEG.
Even if you connect only a stereo TV, front speakers or use a 2+1 channel connection, Virtual Enhanced Surround lets you enjoy 3D sound by using 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L: left, R: right) without using actual rear speakers.
The surround sound signals are output from the AUDIO OUT connectors. These signals are not output from the DIGITAL OUT OPTICAL or COAXIAL connector.
When you select a surround mode, the player does not output the following signals from the DIGITAL OUT OPTICAL or COAXIAL connector.
- Dolby Digital signals (when you set "DOLBY DIGITAL" in "AUDIO SETUP" to "D-PCM")
- MPEG audio signals

Select "VES" after pressing DISPLAY. When you select any item except "OFF," the "VES" indicator lights up in green.

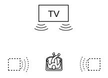


■ **VES**
Select the desired item. For details on each item, see "Effects of each item."
The default setting is underlined.
- <u>OFF</u>
- VES TV
- VES A
- VES B
- VIRTUAL SEMI MULTI DIMENSION

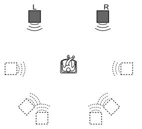
Effects of each item

OFF
Outputs 2-channel signals for stereo sound. 5-channel signals for Dolby Digital sound of a DVD are mixed down to 2-channels.

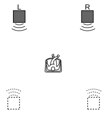
VES (Virtual Enhanced Surround) TV
Uses 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers. This mode is effective when the distance between the front L and R speakers is short, such as built-in stereo TV speakers.



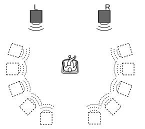
VES (Virtual Enhanced Surround) A
Uses 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers. The virtual speakers are reproduced as shown in the illustration below.



VES (Virtual Enhanced Surround) B
Uses 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers. The virtual speakers are reproduced as shown in the illustration below .



VIRTUAL SEMI MULTI DIMENSION
Uses 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers. This mode creates 5 sets of virtual speakers surrounding the listener at a 30˚ angle of elevation.



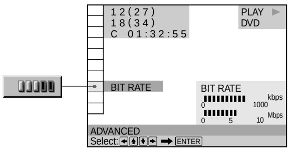
You can select "VES" directly
Press VES on the player. Each time you press the button, the item changes.

Notes
- When you select an item, the sound cuts off for a moment.
- When the playing signal does not contain the surround component, the effects may be difficult to hear even if you select "VES TV," "VES A," "VES B" or "VIRTUAL SEMI MULTI DIMENSION."
- Set the front speakers to form an equilateral triangle with the listening position at the top, or the effects may be difficult to hear even if you select "VES A," "VES B" or "VIRTUAL SEMI MULTI DIMENSION."
- When you select "VES TV," "VES A," "VES B" or "VIRTUAL SEMI MULTI DIMENSION," set the surround settings of the connected units, such as the amplifier, to OFF.

Checking the Play Information DVD

You can check information such as the bit rate or the disc layer that is being played.
While playing a disc, the approximate bit rate of the playback picture is always displayed as Mbps (Mega bit per second) and the audio as kbps (kilo bit per second).

Select "ADVANCED" after pressing DISPLAY.



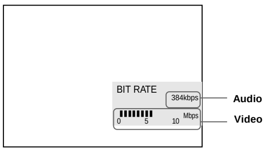
■ **ADVANCED**
The default setting is underlined.

When playing a DVD
- BIT RATE: displays the bit rate.
- LAYER: displays the layer and the pick-up point.
- OFF: turns off ADVANCED display.

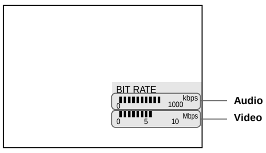
Displays of each item

By pressing DISPLAY repeatedly, you can display either "BIT RATE" or "LAYER," whichever was selected in "ADVANCED."

BIT RATE



When you play MPEG audio sound tracks



Bit rate refers to the amount of video/audio data per second in a disc. The higher the bit rate, the larger the amount of data. When the bit rate level is high, there is a large amount of data. However, this does not always mean that you can get higher quality pictures or sounds.

LAYER

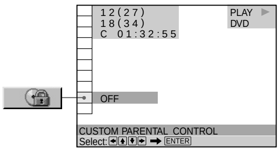
Appears when the DVD has dual layers

Indicates the approximate point where the disc is playing. If it is a dual-layer DVD, the player indicates which layer is being read ("Layer 0" or "Layer 1").
For details on the layers, see page 73 (DVD).

Locking Discs (Custom Parental Control) DVD VIDEO CD CD

Using a registered password, you can set playback restrictions for the desired disc.
You can set the same Custom Parental Control password for up to 50 discs. When you set the fifty-first disc, the first disc is canceled.
The same password is used for both Parental Control (page 61) and Custom Parental Control.

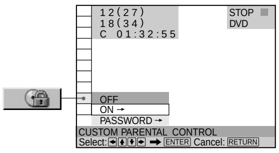
Select "CUSTOM PARENTAL CONTROL" after pressing DISPLAY.



Setting the Custom Parental Control for a disc

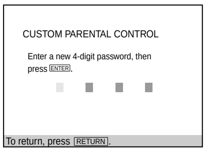
1 **Insert the disc you want to lock.**
If a disc is playing, press ■ to stop playback.

2 **Select "CUSTOM PARENTAL CONTROL" using ↑/↓, then press ENTER.**

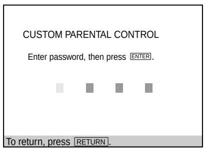


3 **Select "ON→" using ↑/↓, then press ENTER.**

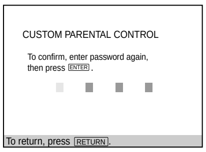
■ **If you have not entered a password**
The display for entering a password appears.



■ **When you have already registered a password**
The display for confirming the password appears. Skip Step 4.



4 **Enter a 4-digit password using the number buttons, then press ENTER.**
The digits change to asterisks (✱), and the display for confirming the password appears.



5 **Enter the same 4-digit password using the number buttons, then press ENTER.**
"Custom parental control is set." appears and then the screen returns to the Control Menu display.

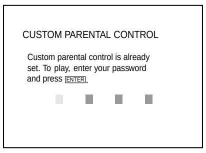
To return to the normal screen
Press RETURN.

To turn off the Custom Parental Control function
1 Select "CUSTOM PARENTAL CONTROL" using ↑/↓, then press ENTER.
2 Select "OFF→" using ↑/↓, then press ENTER.
3 Enter your 4-digit password using the number buttons, then press ENTER.

To change the password
1 Select "CUSTOM PARENTAL CONTROL" using ↑/↓, then press ENTER.
2 Select "PASSWORD→" using ↑/↓, then press ENTER.
3 Enter your 4-digit password using the number buttons, then press ENTER.
The display for changing the password appears.
4 Enter a new 4-digit password using the number buttons, then press ENTER.
5 To confirm your password, re-enter it using the number buttons, then press ENTER.

Playing the disc for which the Custom Parental Control is set

1 **Insert the disc.**
The CUSTOM PARENTAL CONTROL display appears.



2 **Enter your 4-digit password using the number buttons, then press ENTER.**
The player starts playback.

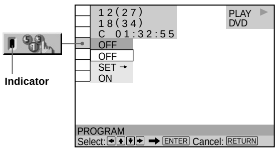
If you forget your password
Enter the 6-digit number "199703" whenever the CUSTOM PARENTAL CONTROL display asks you for your password, then press ENTER. The display will ask you to enter a new 4-digit password.

Note
Unless you enter the password, the player cannot play the disc for which the Custom Parental Control is set. When you do not know the password, press ⏏ and remove the disc.

Creating Your Own Program (Program Play) DVD VIDEO CD CD

You can play the contents of the disc in the order you want by arranging the order of the titles, chapters or tracks on the disc and create your own program. One program can be stored in the player and contain up to 99 titles, chapters and tracks.

Select "PROGRAM" after pressing DISPLAY. When you select "ON," the "PROGRAM" indicator lights up in green.

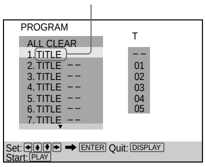


■ **PROGRAM**
The default setting is underlined.
- OFF: plays normally.
- SET→: allows you to create your own program.
- ON: plays Program Play.

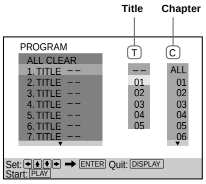
Creating the program

1 **Select "SET→" in "PROGRAM."**
The programming display appears.

"TRACK" is displayed when you play a VIDEO CD or a CD.

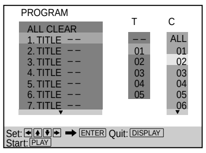


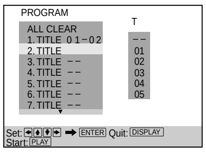
2 **Press →.**
"01" is highlighted. It is ready to set the first title or track for Program Play.



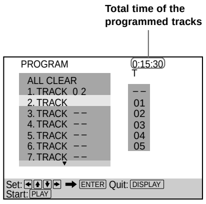
3 **Select the title, chapter or track you want to program using ↑/↓, then press ENTER.**
For example, select title or track 2.
(You can also use the number buttons and ENTER button to make a selection. In this case, the selected number is displayed on the screen.)

■ **When playing a DVD**
When both titles and chapters are recorded on the disc, select the title, then the chapter.





■ **When playing a VIDEO CD or CD**
Select the track you want to program.



4 To program other titles, chapters or tracks, repeat Step 3.
The programmed titles, chapters or tracks are displayed in the selected order.

5 Press ▷ to start Program Play.

To stop Program Play
Press CLEAR on the remote.

To cancel programming
Press PROGRAM on the remote.

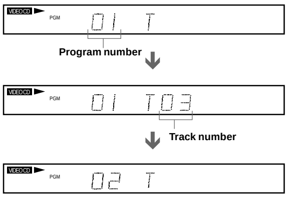
To change the program
1 In Step 2, select the program number of the title, chapter or track you want to change using ↑/↓.
2 Follow Step 3 for new programming.

To cancel the programmed order
To cancel all the titles, chapters or tracks in the programmed order, select "ALL CLEAR" in Step 2.
To cancel the selected program, select the program using ↑/↓ in Step 2 then press CLEAR, or select "- -" in Step 3 then press ENTER.

The program remains even after Program Play ends
When you press ▷, you can play the same program again.

You can do Repeat Play or Shuffle Play of the programmed titles, chapters or tracks
During Program Play, set "REPEAT" or "SHUFFLE" to "ON" in the Control Menu display.

You can select discs, titles, chapters and tracks for the program by looking at the front panel display
You can program by looking at the front panel display instead of using the programming display on the TV screen.
When you select Track 3 in a VIDEO CD for Program 1, the front panel display will appear as follows:



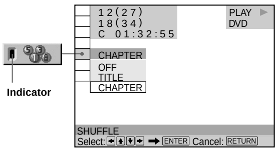
You can display the "PROGRAM" display using the remote
Press PROGRAM on the remote.

Notes
- The number of titles, chapters or tracks displayed are the same number of titles, chapters or tracks recorded on a disc.
- The program is canceled when:
  – you open or close the disc tray
  – the player enters standby mode by pressing I/⏻ on the remote
  – you turn the power off by pressing ⏻ on the player
- Depending on the DVD, you may not be able to perform Program Play.
- If you are using the PBC playback function, you must first stop the disc before you can set a program.
- When playing Super VCDs, the total time of the programmed tracks does not appear on the screen.
- You cannot use the Program Play function in karaoke mode.

Playing in Random Order (Shuffle Play) DVD VIDEO CD CD

You can have the player "shuffle" titles, chapters or tracks and play them in a random order. Subsequent "shuffling" may produce a different playing order.

Select "SHUFFLE" after pressing DISPLAY. When you select a shuffle mode other than "OFF," the "SHUFFLE" indicator lights up in green.



■ **SHUFFLE**
Selects the Shuffle Play setting.
The default settings are underlined.

When playing a DVD and when Program Play is set to OFF
- OFF: does not play a disc in random order.
- TITLE: has the player "shuffle" titles and play them in a random order.
- CHAPTER: has the player "shuffle" chapters and play them in a random order.

When playing a VIDEO CD or CD (when Program Play is set to OFF)
- OFF: does not play a disc in random order.
- TRACK: has the player "shuffle" tracks and play them in a random order.

When playing a VIDEO CD, CD or DVD (when Program Play is set to ON)
- OFF: does not play a disc in random order.
- ON: has the player "shuffle" titles or tracks selected in Program Play and play them in a random order.

To stop Shuffle Play
Press CLEAR on the remote.

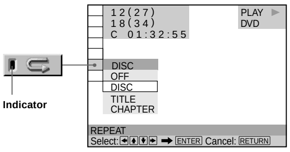
You can set Shuffle Play while the disc is stopped
After selecting the "SHUFFLE" option, press ▷.
The player starts Shuffle Play.

Notes
- Shuffle Play is canceled when:
  – you open or close the disc tray
  – the player enters standby mode by pressing I/⏻ on the remote
  – you turn the power off by pressing ⏻ on the player
- Up to 200 chapters in a disc can be played in random order when "CHAPTER" is selected.
- Depending on the DVD, you may not be able to perform Shuffle Play.
- You cannot perform Shuffle play during PBC playback of VIDEO CDs (page 22).

Playing Repeatedly (Repeat Play) DVD VIDEO CD CD

You can play all of the titles or tracks on a disc or a single title, chapter or track repeatedly.
In Shuffle or Program Play mode, the player repeats the titles or tracks in the shuffled or programmed order.
You cannot perform Repeat Play during PBC playback of VIDEO CDs (page 22).

Select "REPEAT" after pressing DISPLAY. When you select a repeat mode other than "OFF," the "REPEAT" indicator lights up in green.



■ **REPEAT**
Selects the Repeat Play setting.
The default settings are underlined.

When playing a DVD and when Program Play and Shuffle Play are set to OFF
- OFF: does not play repeatedly.
- DISC: repeats all of the titles.
- TITLE: repeats the current title on a disc.
- CHAPTER: repeats the current chapter.

When playing a VIDEO CD/CD and when Program Play and Shuffle Play are set to OFF
- OFF: does not play repeatedly.
- DISC: repeats all of the tracks on a disc.
- TRACK: repeats the current track.

When Program Play or Shuffle Play is on
- OFF: does not play repeatedly.
- ON: repeats Program Play or Shuffle Play.

To stop Repeat Play
Press CLEAR on the remote.

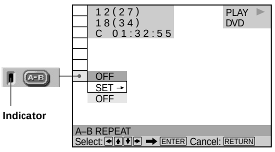
You can set Repeat Play while the disc is stopped
After selecting the "REPEAT" option, press ▷.
The player starts Repeat Play.

Notes
- Repeat play is canceled when:
  – you open or close the disc tray
  – the player enters standby mode by pressing I/⏻ on the remote
  – you turn the power off by pressing ⏻ on the player
- Depending on the DVD, you may not be able to perform Repeat Play.

Repeating a Specific Portion (A-B Repeat) DVD VIDEO CD CD

You can play a specific portion of a title, chapter or track repeatedly. This function is useful when you want to do such things as memorize lyrics.
During PBC Playback of VIDEO CDs (page 22), this function is available only while playing moving pictures.

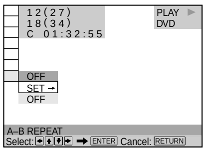
Select "A-B REPEAT" after pressing DISPLAY. During A-B Repeat Play, the "A-B REPEAT" indicator lights up in green.



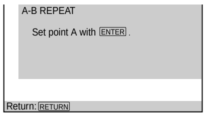
■ **A-B REPEAT**
The default setting is underlined.
- SET➡: sets the A and B points.
- OFF: does not play a specific portion of a title/chapter/track repeatedly.

Setting a portion for A-B repeat

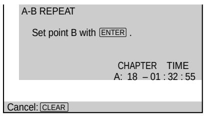
1 Select "A-B REPEAT" and press ENTER.



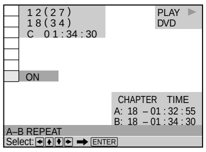
2 Select "SET➡" and press ENTER.
The A-B REPEAT setting display appears.



3 During playback, when you find the starting point (point A) of the portion to be played repeatedly, press ENTER.
The starting point (point A) is set.



4 When you reach the ending point (point B), press ENTER again.
The set points are displayed and the player starts repeating this specific portion.
"A-B" appears on the front panel display during A-B repeat play.



To stop A-B Repeat Play
Press CLEAR on the remote.

Notes
- You can set A-B Repeat for only one specific portion.
- A-B Repeat is canceled when:
  – you open or close the disc tray
  – the player enters standby mode by pressing I/⏻ on the remote
  – you turn the power off by pressing ① on the player
- When you set A-B Repeat, the settings for Shuffle Play, Repeat Play and Program Play are canceled.
- You may not be able to set A-B Repeat for some DVD or VIDEO CD scenes.

Enjoying Karaoke

This chapter describes how to play discs in karaoke mode and how to use the various karaoke features .

Using Karaoke

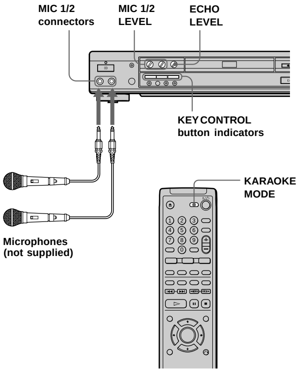
You can enjoy karaoke (singing along with a disc) by setting this player to karaoke mode. You can connect up to two microphones (not supplied) to the player.

Setting the player to karaoke mode

The player enters karaoke mode when a microphone is plugged into the MIC 1 or 2 connector.
The player exits from karaoke mode when you disconnect the microphones from both of the MIC 1 and 2 connectors. You may also switch karaoke mode on or off by pressing KARAOKE MODE on the remote. The KEY CONTROL button indicators light up when the player is in karaoke mode.

When you turn the karaoke mode on with DVDs or Super VCDs, the karaoke play is performed with the audio channel you selected in "AUDIO" of the Control Menu display. With CDs or VIDEO CDs, the "AUDIO" setting automatically changes to "1/L" so that only the accompaniment is played when you turn the karaoke mode on. If the vocal audio is heard with some discs, select the audio channel for the karaoke play in "AUDIO" of the Control Menu display (page 31).

Notes on karaoke mode
- You cannot use the karaoke function with the DIGITAL OUT connectors.
- You cannot use the Program Play function in karaoke mode.
- Sound tracks with a 96 kHz (PCM) sampling frequency are converted to 48 kHz (sampling frequency) in karaoke mode.



Adjusting the microphone

1 Set the MIC 1/2 LEVEL control of the MIC connector to MIN.

2 Plug a microphone (not supplied) into the MIC connector.
When a microphone is connected to the MIC 1 or 2 connector, the player enters karaoke mode.

3 Set the ON/OFF switch on the microphone to ON and turn the MIC 1/2 LEVEL control to adjust the microphone volume.

4 Turn the ECHO LEVEL control to adjust the echo.
The same echo level is applied to all connected microphones.

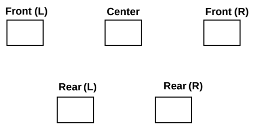
If howling occurs
- Move the microphone away from the speakers.
- Lower the microphone volume or echo level.
- Lower the overall volume.

Notes
- The sound input from the microphone is not output from the DIGITAL OUT (OPTICAL, COAXIAL) connectors.
- You can turn the karaoke mode off even when a microphone is connected to the MIC 1 or 2 connectors by pressing KARAOKE MODE on the remote. You can continue using the microphone but the echo function and the ECHO LEVEL control do not work.

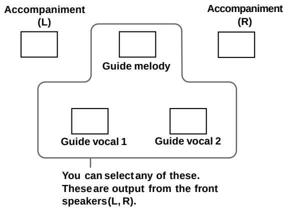
Dolby Digital Karaoke format DVD

Dolby Digital format, which reproduces surround sound using 5 channels, contains the "Dolby Digital Karaoke" format specialized for karaoke. In the Dolby Digital Karaoke format discs, guide melody and guide vocal tracks are recorded in addition to the accompaniment. You can select them when the player is in karaoke mode.

Speaker output in normal Dolby Digital format (5 channel surround)

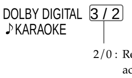


Speaker output in Dolby Digital Karaoke format



You can check the audio information using "AUDIO" in the Control Menu display. When playing a Dolby Digital Karaoke disc, "♪KARAOKE" appears at the current audio format (page 32).

Example:



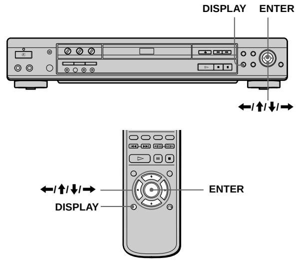
2/0 : Recorded only with accompaniment.
3/0 : Recorded with guide melody.
3/1 : Recorded with guide melody and guide vocal.
3/2 : Recorded with guide melody and two kinds of guide vocals.

Using the Karaoke Control Menu Display DVD VIDEO CD CD

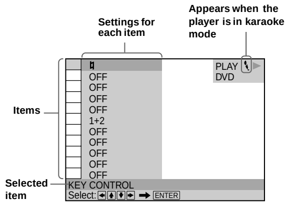
You can use the Karaoke Control Menu display when the player is in karaoke mode. Using the Karaoke Control Menu display, you can enjoy karaoke features such as changing the key, applying effects and programming the next titles and tracks.
For details about each Karaoke Control Menu item, see pages 48 to 55.

Displaying the Karaoke Control Menu display

Set the player to karaoke mode (page 45), then press DISPLAY until the Karaoke Control Menu display appears. Use ↑/↓ to select item you want, then press ENTER. The Karaoke Control Menu selection operations are the same as the Control Menu operations. For details about the Control Menu operations, see "Using the Control Menu Display" on page 25.



Karaoke Control Menu display



The Karaoke Control Menu display items are different depending on the disc.

Karaoke Control Menu item list

KEY CONTROL (pages 48)
You can change the key to suit your vocal range.

KARAOKE SURROUND (page 48)
The karaoke surround function gives surround effects to the accompaniment sound.

KARAOKE STAR (page 49)
The Karaoke Star function gives effects to your voice.

KARAOKE PON (page 49)
You can enjoy karaoke with a stereo-recorded disc, even if it is a non-karaoke disc, by reducing the sound of the vocals.

VOCAL (page 50)
When playing a DVD with the Dolby Digital Karaoke format in karaoke mode, you can turn on or off the guide vocal.
When playing a VIDEO CD/CD in karaoke mode, you can listen to the vocals.

VOCAL SELECT (page 51)
You can select different kind of vocals recorded in the disc.

VOCAL SUPPORT (page 52)
The recorded vocal will play when you stop singing during a song.

GUIDE MELODY (DVD only) (page 52)
You can listen to the guide melody.

FIRST VERSE PLAY (DVD only) (page 53)
You can play only the first verse of each title.

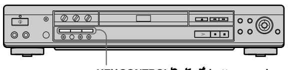
CHORUS MEDLEY (DVD only) (page 53)
You can sequentially play the chorus part of all titles in a disc.

AUTO PAUSE (VIDEO CD/CD only) (page 54)
You can set the player to pause every time a track is played.

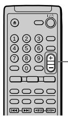
RESERVE (page 54)
You can select and reserve up to 24 titles/tracks when the player is in karaoke mode. You can reserve additional titles/tracks even if somebody is performing karaoke.

Changing the Key (Key Control) DVD VIDEO CD CD

You can change the key to suit your vocal range.
While playing karaoke, press one of the KEY CONTROL buttons repeatedly to find the key that suits your vocal range.



KEY CONTROL ♭, ♮, ♯ buttons and indicators
These indicators light up when you select one of the keys.



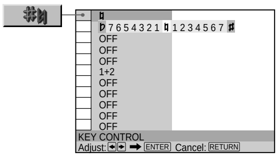
KEY ♯, ♭

Press KEY CONTROL or KEY in karaoke mode.

To	Press
raise the key	♯
lower the key	♭
return to the original key	♮

You can adjust the key in 15 half-tone steps (7 steps higher, 7 steps lower and the original key).

You can change the key using "KEY CONTROL" in the Karaoke Control Menu display
Select "KEY CONTROL" in the Karaoke Control Menu display (page 47), change the key using ←/→, and then press ENTER.

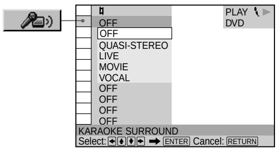


Notes
- The key automatically returns to the original key when the title or track changes.
- This function has no effect on the output sound from the WOOFER connector.

Applying the Surround Effect (Karaoke Surround) DVD VIDEO CD CD

The karaoke surround function gives surround effects to the accompaniment sound.

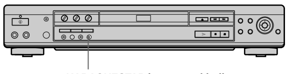
Select "KARAOKE SURROUND" in the Karaoke Control Menu display. Select the karaoke surround mode using ↑/↓, and then press ENTER. To cancel the karaoke surround, select "OFF" using ↑/↓, and then press ENTER.
To use the Karaoke Control Menu display, see "Displaying the Karaoke Control Menu display" on page 47.



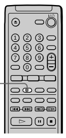
■ **KARAOKE SURROUND**
- OFF: turns off the karaoke surround function.
- QUASI-STEREO: gives a stereo like effect to the monaural accompaniment sound. This mode is effective with CDs/VIDEO CDs.
- LIVE: emphasizes treble frequencies of the accompaniment sound to give a live concert performance effect.
- MOVIE: gives a theater performance effect to the accompaniment sound.
- VOCAL: reduces the accompaniment sound level so that your voice is emphasized. This mode is effective with CDs/VIDEO CDs.

Additing Richness to Your Voice (Karaoke Star) DVD VIDEO CD CD

The Karaoke Star function gives effects to your voice.



KARAOKESTAR button and indicator
The indicator lights up when you select a karaoke star mode other than "OFF."



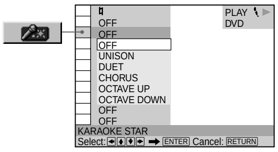
KARAOKE STAR

Press KARAOKE STAR in karaoke mode.
Each time you press KARAOKE STAR, the effect changes as follows:

OFF: turns off the karaoke star function
↓
UNISON: gives the effect of depth to the vocal voice
↓
DUET: gives a duet like effect to the vocal voice
↓
CHORUS: gives a chorus like effect to the vocal voice
↓
OCTAVE UP: raises the tone of the vocal voice by one octave
↓
OCTAVE DOWN: lowers the tone of the vocal voice by one octave

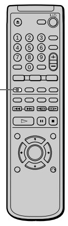
The KARAOKE STAR effect is enhanced when you increase the echo level.

You can select the Karaoke Star mode using "KARAOKE STAR" in the Karaoke Control Menu display
Select "KARAOKE STAR" in the Karaoke Control Menu display (page 47), select the item using ↑/↓, and then press ENTER.



Playing Karaoke with Any Stereo Disc (Karaoke Pon) DVD VIDEO CD CD

You can enjoy karaoke with a stereo-recorded disc, even if it is a non-karaoke disc, by reducing the sound of the vocals.

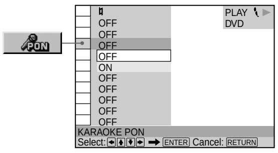


KARAOKE PON

Press KARAOKE PON in karaoke mode.

To cancel the Karaoke Pon function
Press KARAOKE PON again.

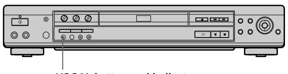
You can turn the Karaoke Pon function on and off using "KARAOKE PON" in the Karaoke Control Menu display
Select "KARAOKE PON" in the Karaoke Control Menu display (page 47), select "ON" or "OFF" using ↑/↓, and then press ENTER.



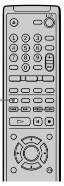
Notes
- The stereo effect will be reduced.
- This function may not work well in the following cases:
  – only a few instruments are playing
  – a duet is playing
  – the vocals on the disc deviate from the center
  – monaural-recorded discs (the accompaniment is also reduced)
  – multiplex discs

Turning the Vocals On and Off (Vocal) DVD VIDEO CD CD

When playing a DVD with the Dolby Digital Karaoke format in karaoke mode, you can turn on or off the guide vocal recorded in the karaoke track.
When playing a VIDEO CD/CD in karaoke mode, you can listen to the vocals.



VOCAL button and indicator
The indicator lights up when the Vocal function is turned on.



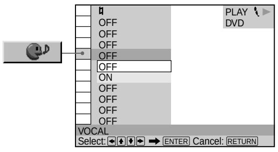
VOCAL

When playing a DVD
You can listen to the guide vocal recorded in the Dolby Digital karaoke format track.
Press VOCAL while playing a disc. To cancel the guide vocal, press VOCAL again.

Notes
- This function works only with the Dolby Digital Karaoke format.
- If the guide vocal is not recorded on the disc, you cannot use the Vocal function.

When playing a VIDEO CD or CD
When VIDEO CDs and CDs are played in karaoke mode, the audio output automatically changes so that only the left channel (accompaniment track) is played and output from both front speakers (L, R).
You can listen to the vocals by pressing VOCAL while the accompaniment is being played.

You can turn the Vocal function on and off using "VOCAL" in the Karaoke Control Menu display
Select "VOCAL" in the Karaoke Control Menu display (page 47), select "ON" or "OFF" using ↑/↓, and then press ENTER.

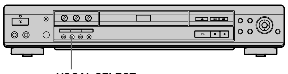


You can select the vocals
When the Vocal function is set to on, you can change the guide vocal by pressing VOCAL SELECT. See "Selecting the Vocals" (page 51).

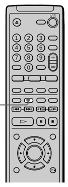
Notes
- When you turn the Vocal function on, the Vocal Support function is automatically turned off (page 52).
- When you turn the Vocal function on and off while playing a Super VCD, the sound may cut off for a moment.

Selecting the Vocals (Vocal Select) DVD VIDEO CD CD

After you have set Vocal (page 50) or Vocal Support (page 52) to ON, you can change the guide vocal channel. You can select different kinds of vocals when using the Vocal or Vocal Support function.



VOCAL SELECT



VOCAL SELECT

When playing a DVD
During playback, press VOCAL SELECT.
Each time you press VOCAL SELECT, the guide vocal channel changes as follows:

1+2 (Guide vocal 1+2)
↓
1 (Guide vocal 1)
↓
2 (Guide vocal 2)

Notes
- This function works only with the Dolby Digital Karaoke format.
- Depending on the DVD, you may not be able to do the operations above.
- If only one guide vocal is recorded in the disc, you can select only "1."

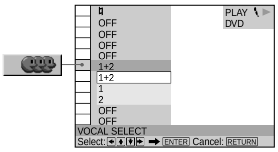
When playing a VIDEO CD or CD
To select the vocal track, press VOCAL SELECT during playback.
Each time you press VOCAL SELECT, the output channel changes as follows:

L+R (same sound is output from both speakers)
↓
STEREO

When playing a Super VCD
To select the vocal track, press VOCAL SELECT during playback.
Each time you press VOCAL SELECT, the output channel changes as follows:

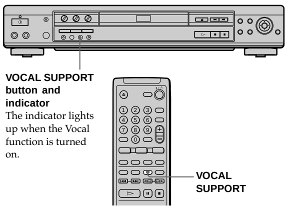
1: L+R
↓
1: STEREO
↓
2: L+R
↓
2: STEREO

You can select the vocals using "VOCAL SELECT" in the Karaoke Control Menu display
Select "VOCAL SELECT" in the Karaoke Control Menu display (page 47), select the vocals using ↑/↓, and then press ENTER.



Being Supported by the Recorded Vocal Track (Vocal Support) DVD VIDEO CD CD

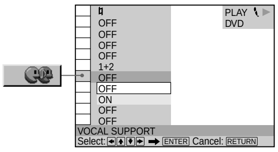
The recorded vocal will play when you stop singing during a song.



When playing a DVD
You can use the Vocal Support function only with the Dolby Digital Karaoke format.
Press VOCAL SUPPORT while playing a disc in karaoke mode. To cancel the Vocal Support function, press VOCAL SUPPORT again.

When playing a VIDEO CD or CD
Press VOCAL SUPPORT while playing a disc in karaoke mode. To cancel the Vocal Support function, press VOCAL SUPPORT again.

You can turn the Vocal Support function on and off using "VOCAL SUPPORT" in the Karaoke Control Menu display
Select "VOCAL SUPPORT" in the Karaoke Control Menu display (page 47), select "ON" or "OFF" using ↑/↓, and then press ENTER.



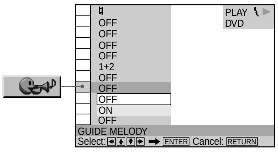
You can select the vocals
When the Vocal Support function is set to ON, you can change the guide vocal by pressing VOCAL SELECT. See "Selecting the Vocals" (page 51).

Notes
- When you turn the Vocal Support function on, the Vocal function is automatically turned off (page 50).
- When switching the recorded vocal and your vocal while playing a Super VCD, the sound may cut off for a moment.

Turning the Guide Melody On and Off (Guide Melody) DVD

You can listen to the guide melody.

Select "GUIDE MELODY" in the Karaoke Control Menu display. To turn the guide melody on, select "ON" using ↑/↓, and then press ENTER. To cancel the guide melody, select "OFF" using ↑/↓, and then press ENTER.
To use the Karaoke Control Menu display, see "Displaying the Karaoke Control Menu display" on page 47.

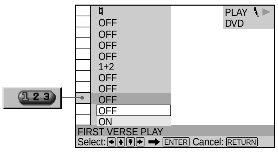


Notes
- This function works only with the Dolby Digital Karaoke format.
- If no guide melody is recorded on the disc, you cannot hear the guide melody even if you turn it on.

Playing Only the First Verse of Each Title (First Verse Play) DVD

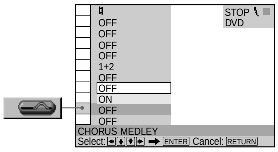
You can play only the first verse of each title. Use this when you want to sing many songs. You can use this function only for DVDs with the First Verse function.

Select "FIRST VERSE PLAY" in the Karaoke Control Menu display. To turn the First Verse function on, select "ON" using ↑/↓, and then press ENTER. To cancel the First Verse function, select "OFF" using ↑/↓, and then press ENTER.
To use the Karaoke Control Menu display, see "Displaying the Karaoke Control Menu display" on page 47.



Searching for a Title by Listening to the Chorus (Chorus Medley) DVD

You can sequentially play the chorus part of all titles in a disc. You can use this function only for DVDs with the Chorus Medley function.



1 Before you start playing, select "CHORUS MEDLEY" in the Karaoke Control Menu display. Select "ON" using ↑/↓, and then press ENTER.
To use the Karaoke Control Menu display, see "Displaying the Karaoke Control Menu display" on page 47.

2 Press ▷.
The player starts Chorus Medley playback.

To go to the chorus part of the next title
Press ▶▶I.

To go back to the chorus part of the preceding title
Press I◀◀.

To start playback from the beginning of the title being played
During Chorus Medley playback, press ▷. Chorus Medley playback is canceled.

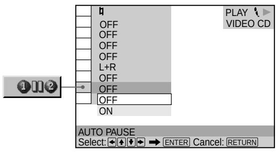
To cancel Chorus Medley playback
Select "CHORUS MEDLEY" in the Karaoke Control Menu display, select "OFF" using ↑/↓, and then press ENTER.

Note
If you press CHORUS MEDLEY while playing a disc, the Chorus Medley function will not work.

Pausing at the End of Each Track (Auto Pause) VIDEO CD CD

You can set the player to pause every time a track is played.

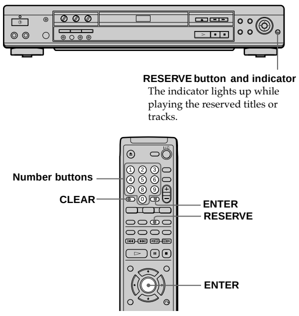
Select "AUTO PAUSE" in the Karaoke Control Menu display. To turn the Auto Pause function on, select "ON" using ↑/↓, and then press ENTER. To cancel the Auto Pause function, select "OFF" using ↑/↓, and then press ENTER.
To use the Karaoke Control Menu display, see "Displaying the Karaoke Control Menu display" on page 47.



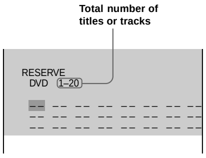
Note
The Auto Pause function does not work during PBC playback of a VIDEO CD.

Reserving Karaoke (Reserve) DVD VIDEO CD CD

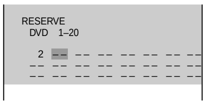
You can select and reserve up to 24 tracks/titles when the player is in karaoke mode. You can reserve additional tracks/titles even if somebody is performing karaoke. Once the track or title is performed, it disappears from the reserve list.



1 Press RESERVE in karaoke mode.
The RESERVE display appears and the RESERVE indicator flashes.

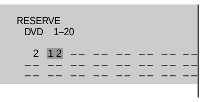


2 Input the title or track number using the number buttons, then press ENTER.

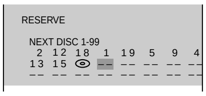


To cancel this title or track, press CLEAR.

3 To reserve other titles or tracks, repeat Step 2.
You can reserve other titles or tracks even while playing a disc.



To reserve titles or tracks from another disc:
1 Press 0.
"(next disc)" appears.
2 Press ENTER.
3 Input the title or track number of another disc.
When the player reaches "(next disc)," it will stop so that you can change the disc.



To cancel the number, press CLEAR.

The reserved titles or tracks are played in the reserved order.
If you reserve titles or tracks when the player is in stop mode, press ▷ to start Reserve Play.

To exit the RESERVE display
Press RESERVE. The RESERVE display is turned off. However, the player memorizes the contents of the reserve list.

To cancel Reserve Play
Select "OFF" in "RESERVE" in the Karaoke Control Menu display or press CLEAR. All of the reserve settings are erased.

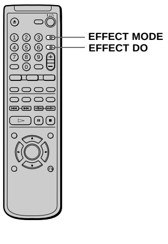
You can display the "RESERVE" list using the Karaoke Control Menu display
Select "SET➡" in "RESERVE" in the Karaoke Control Menu display (page 47).

You can select a reserved title or track
While playing the reserved title or track, press the I◀◀/▶▶I buttons to jump to the next or previous title or track.

Notes
- You cannot do Shuffle Play and Repeat Play while using this function. The Shuffle Play or Repeat Play setting is canceled when you start reserving tracks or titles.
- If the reserved title or track does not exist, "Reserve play of title** is prohibited." or "Reserve play of track** is prohibited." appears and the next title or track is played.
- The reserve function does not work during PBC playback of a VIDEO CD.

Inserting the Applause Effect (Effect Mode) DVD VIDEO CD CD

You can insert applause with or without cheers in the karaoke mode.



To automatically insert the effect at the beginning and end of the titles and tracks
Press EFFECT MODE to select applause only or applause with cheers. (You may not be able to do this operation depending on the DVD or when doing PBC playback of a VIDEO CD.)
Each time you press EFFECT MODE, the effect changes as follows:

OFF
↓
1 (applause)
↓
2 (applause and cheers)

To instantly insert the effect whenever you want
Press EFFECT DO when you want to insert the applause effect.
You may insert applause and cheers using this button even if EFFECT MODE is set to OFF.

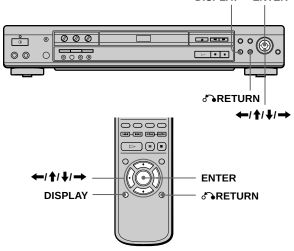
Settings and Adjustments

This chapter describes how to set and adjust the player using the on-screen setup menu. Most settings and adjustments are required to be set when you first use the player.

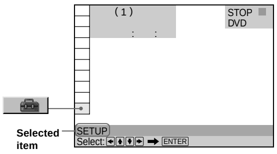
Using the Setup Display DVD VIDEO CD CD

Using the setup display, you can do the initial setup, adjust the picture and sound and set the various outputs. You can also set a language for the subtitles and the setup display, limit playback by children, and so on.
For details on each setup display item, see pages 59 to 67.

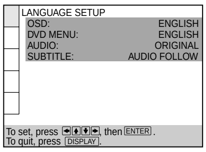
Note
You can display the setup display only when the player is in stop mode.



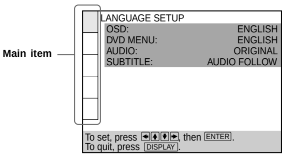
1 Press DISPLAY and select "SETUP" using ↑/↓.



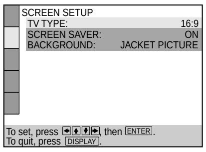
2 Press ENTER.
The setup display appears.



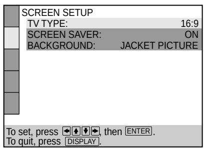
3 Select the main item you want using ↑/↓.



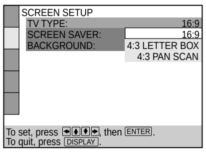
4 Press ENTER.
The selected main item is highlighted.



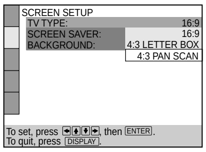
5 Select the item you want using ↑/↓.



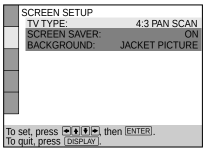
6 Press ENTER.



7 Select the setting you want using ←/↑/↓/→.



8 Press ENTER.



9 PressDISPLAY.
The setup display disappears.

10 PressDISPLAY repeatedly to turn off the on-screen menu.

To return to the previous screen
Press RETURN.

To quit while making a selection
Press DISPLAY.

Note
Some setup display items require operations other than selecting the setting. For details on these items, see the relevant pages.

Setup Display Item List

The default settings are underlined.

LANGUAGE SETUP (page 59)
- OSD
  - ENGLISH (default)
  - CHINESE 1
  - CHINESE 2
- DVD MENU
  - ENGLISH (default)
  - CHINESE
  - JAPANESE
  - FRENCH
  - GERMAN
  - ITALIAN
  - SPANISH
  - DUTCH
  - DANISH
  - SWEDISH
  - FINNISH
  - NORWEGIAN
  - PORTUGUESE
  - RUSSIAN
  - OTHERS →
- AUDIO
  - ORIGINAL (default)
  - (same as DVD MENU)
- SUBTITLE
  - AUDIO FOLLOW (default)
  - (same as DVD MENU)

SCREEN SETUP (page 60)
- TV TYPE
  - 16:9 (default)
  - 4:3 LETTER BOX
  - 4:3 PAN SCAN
- SCREEN SAVER
  - ON (default)
  - OFF
- BACKGROUND
  - JACKET PICTURE (default)
  - GRAPHICS
  - BLUE/MAGENTA
  - BLACK

CUSTOM SETUP (page 61)
- COLOR SYSTEM
  - AUTO (default)
  - PAL
  - NTSC
- AUTO PLAY
  - OFF (default)
  - TIMER
  - DEMO1
  - DEMO2
- DIMMER
  - BRIGHT (default)
  - DARK
  - OFF
- PAUSE MODE
  - AUTO (default)
  - FRAME
- PARENTAL CONTROL →
- TRACK SELECTION
  - OFF (default)
  - AUTO

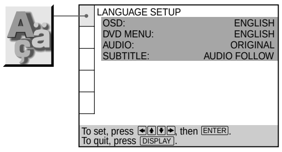
AUDIO SETUP (page 65)
- AUDIO ATT
  - OFF (default)
  - ON
- AUDIO DRC
  - STANDARD (default)
  - TV MODE
  - WIDE RANGE
- DOWNMIX
  - DOLBY SURROUND (default)
  - NORMAL
- DIGITAL OUT
  - ON (default)
    - DOLBY DIGITAL
      - D-PCM (default)
      - DOLBY DIGITAL
    - MPEG
      - PCM (default)
      - MPEG
    - DTS
      - OFF (default)
      - ON
  - OFF

SPEAKER SETUP (page 67)
- SUBWOOFER
  - NONE
  - YES (default)
    - FRONT SPEAKER SIZE
      - LARGE
      - MIDDLE (default)
      - SMALL
      - TV

Setting the Display Language or Sound Track (LANGUAGE SETUP) DVD VIDEO CD CD

"LANGUAGE SETUP" allows you to set various languages for the on-screen display or sound track.
The default settings are underlined.

Select "LANGUAGE SETUP" in the setup display.



Notes
- When you select a language that is not recorded on the DVD, one of the recorded languages is automatically selected for the "DVD MENU," "AUDIO" and "SUBTITLE" settings.
- Depending on the DVD, the player may not start playing with the selected language even when you select a language in "DVD MENU," "AUDIO" or "SUBTITLE."

■ OSD (On-Screen Display)
Selects the language for the on-screen display.
- ENGLISH
- CHINESE 1
- CHINESE 2

■ DVD MENU
Selects the language for the DVD menu.
- ENGLISH
- CHINESE
- JAPANESE
- FRENCH
- GERMAN
- ITALIAN
- SPANISH
- DUTCH
- DANISH
- SWEDISH
- FINNISH
- NORWEGIAN
- PORTUGUESE
- RUSSIAN
- OTHERS →

When you select "OTHERS →," select and enter the language code from the list using the number buttons (page 75).
After you have made a selection, the language code (4 digits) is displayed.

■ AUDIO
Selects the language for the sound track.
- ORIGINAL: the language given priority in the disc
- ENGLISH
- CHINESE
- JAPANESE
- FRENCH
- GERMAN
- ITALIAN
- SPANISH
- DUTCH
- DANISH
- SWEDISH
- FINNISH
- NORWEGIAN
- PORTUGUESE
- RUSSIAN
- OTHERS →

When you select "OTHERS →," select and enter the language code from the list using the number buttons (page 75).
After you have made a selection, the language code (4 digits) is displayed.

■ SUBTITLE
Selects the language for the subtitles.
- AUDIO FOLLOW*
- ENGLISH
- CHINESE
- JAPANESE
- FRENCH
- GERMAN
- ITALIAN
- SPANISH
- DUTCH
- DANISH
- SWEDISH
- FINNISH
- NORWEGIAN
- PORTUGUESE
- RUSSIAN
- OTHERS →

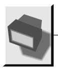
When you select "OTHERS →," select and enter the language code from the list using the number buttons (page 75).
After you have made a selection, the language code (4 digits) is displayed.

* When you select "AUDIO FOLLOW," the language for the subtitles changes according to the language for the setting you selected in "AUDIO."

Settings for the Display (SCREEN SETUP) DVD VIDEO CD CD

"SCREEN SETUP" allows you to set the display according to the playback conditions.
The default settings are underlined.

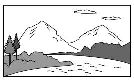
Select "SCREEN SETUP" in the setup display.



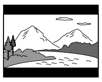
SCREEN SETUP
TV TYPE: 16:9
SCREEN SAVER: ON
BACKGROUND: JACKET PICTURE
To set, press ←/↑/↓/→, then ENTER.
To quit, press DISPLAY.

■ TV TYPE
Selects the aspect ratio of the TV to be connected.
- 16:9: select this when you connect a wide-screen TV to the player.
- 4:3 LETTER BOX: select this when you connect a normal TV to the player. Displays a wide picture with bands on the upper and lower portions of the screen.
- 4:3 PAN SCAN: select this when you connect a normal TV to the player. Displays the wide picture on the whole screen automatically and cuts off the portions that do not fit.

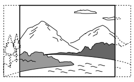
16:9



4:3 LETTER BOX



4:3 PAN SCAN



Note
Depending on the DVD, "4:3 LETTER BOX" may be selected automatically instead of "4:3 PAN SCAN" and vice versa.

■ SCREEN SAVER
Turns on and off the screen saver. If you turn on the screen saver, the screen saver image appears when you leave the player or the remote in pause or stop mode for 15 minutes, or when you play back a CD for more than 15 minutes. The screen saver will help prevent your display device from becoming damaged.
- ON: turns on the screen saver.
- OFF: turns off the screen saver.

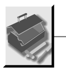
■ BACKGROUND
Selects the background color or picture on the TV screen in stop mode or while playing a CD.
- JACKET PICTURE: The jacket picture appears in the background, but only when the jacket picture is already recorded on the disc.
- GRAPHICS: A preset picture stored in the player appears in the background.
- BLUE/MAGENTA: The background color is blue. When the player is in karaoke mode, the background color changes to magenta.
- BLACK: The background color is black.

Note
If a disc which does not contain the jacket picture is played while "BACKGROUND" is set to "JACKET PICTURE," the picture stored in the player will automatically appear in the background.

Custom Settings (CUSTOM SETUP) DVD VIDEO CD CD

"CUSTOM SETUP" allows you to set the playback conditions.
The default settings are underlined.

Select "CUSTOM SETUP" in the setup display.



CUSTOM SETUP
COLOR SYSTEM: AUTO
AUTO PLAY: OFF
DIMMER: BRIGHT
PAUSE MODE: AUTO
PARENTAL CONTROL →
TRACK SELECTION: OFF
To set, press ←/↑/↓/→, then ENTER.
To quit, press DISPLAY.

■ COLOR SYSTEM
Selects the color system when you play a VIDEO CD.
- AUTO: outputs the video signal in the system of the VIDEO CD, either PAL or NTSC. If your TV is the DUAL system, select AUTO.
- PAL: changes the video signal of an NTSC VIDEO CD and outputs it in the PAL system.
- NTSC: changes the video signal of a PAL VIDEO CD and outputs it in the NTSC system.

Notes
- You cannot change the color system of the DVD itself.
- You can change the color system of this unit according to the connected TV. See page 9.

■ AUTO PLAY
Selects the Auto Play setting when you connect the mains lead to mains.
- OFF: does not use "TIMER," "DEMO1" or "DEMO2" to start playback.
- TIMER: starts playing at any time you want when connected to a timer (not supplied). Set the timer when the player is in standby mode (the power indicator lights up in red).
- DEMO1: starts playing the first demonstration automatically.
- DEMO2: starts playing the second demonstration automatically.

■ DIMMER
Adjusts the lighting of the front panel display.
- BRIGHT: makes the front panel display bright.
- DARK: makes the front panel display dark.
- OFF: turns off the lighting of the front panel display.

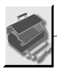
■ PAUSE MODE (DVD only)
Selects the picture in pause mode.
- AUTO: A picture including subjects that move dynamically is output with no jitter. Normally select this position.
- FRAME: A picture including subjects that do not move dynamically is output with high resolution.

■ PARENTAL CONTROL →
Sets a password and playback limitation level for DVDs with playback limitation for children.
The same password is used for both Parental Control and Custom Parental Control (page 37) .
For details, see "Limiting Playback by Children (Parental Control)."

Limiting Playback by Children (Parental Control) DVD

Playback of some DVDs can be limited depending on the age of the users. The "Parental Control" function allows you to set a playback limitation level.

Select "CUSTOM SETUP" in the setup display.



CUSTOM SETUP
COLOR SYSTEM: AUTO
AUTO PLAY: OFF
DIMMER: BRIGHT
PAUSE MODE: AUTO
PARENTAL CONTROL →
TRACK SELECTION: OFF
To set, press ←/↑/↓/→, then ENTER.
To quit, press DISPLAY.

1 Select "PARENTAL CONTROL" using ↑/↓, then press ENTER.

CUSTOM SETUP
COLOR SYSTEM: AUTO
AUTO PLAY: OFF
DIMMER: BRIGHT
PAUSE MODE: AUTO
PARENTAL CONTROL →
TRACK SELECTION: OFF
To set, press ←/↑/↓/→, then ENTER.
To quit, press DISPLAY.

■ When you have not entered a password
The display for entering a password appears.

CUSTOM SETUP
PARENTAL CONTROL
Enter a new 4-digit password, then press ENTER.
To return, press RETURN.
To cancel, press DISPLAY.

■ When you have already registered a password
The display for confirming the password appears. Skip Step 2.

CUSTOM SETUP
PARENTAL CONTROL
Enter password, then press ENTER.
To return, press RETURN.
To cancel, press DISPLAY.

2 Enter a password in 4 digits using the number buttons, then press ENTER.
The digits change to asterisks (*), and the display for confirming the password appears.

CUSTOM SETUP
PARENTAL CONTROL
To confirm,enter password again, then press ENTER.
To return, press RETURN.
To cancel, press DISPLAY.

3 To confirm your password, enter it again using the number buttons, then press ENTER.
The display for setting the playback limitation level and changing the password appears.

CUSTOM SETUP
PARENTAL CONTROL
LEVEL: OFF
STANDARD: USA
CHANGE PASSWORD →
To set, press ←/↑/↓/→, then ENTER.
To quit, press DISPLAY.

4 Select "STANDARD" using ↑/↓, then press →.

CUSTOM SETUP
PARENTAL CONTROL
LEVEL: OFF
STANDARD: USA
CHANGE PASSWORD →
To set, press ←/↑/↓/→, then ENTER.
To quit, press DISPLAY.

5 Select a geographic area as the playback limitation level standard using ↑/↓, then press →.
When you select "OTHERS →," select and enter the standard code in the table on the next page using the number buttons.

CUSTOM SETUP
PARENTAL CONTROL
LEVEL: OFF
STANDARD: USA
CHANGE PASSWORD USA
OTHERS →
To set, press ←/↑/↓/→, then ENTER.
To quit, press DISPLAY.

6 Select "LEVEL" using ↑/↓, then press →.

CUSTOM SETUP
PARENTAL CONTROL
LEVEL: OFF
STANDARD: OFF
CHANGE PASSWORD 8:
7: NC17
6: R
5:
To set, press ←/↑/↓/→, then ENTER.
To quit, press DISPLAY.

7 Select the level you want using ↑/↓, then press ENTER.

CUSTOM SETUP
PARENTAL CONTROL
LEVEL: 4: PG13
STANDARD: USA
CHANGE PASSWORD →
To set, press ←/↑/↓/→, then ENTER.
To quit, press DISPLAY.

The lower the value, the more strict the limitation.

To return to the normal screen
Press DISPLAY.

To turn off the Parental Control function and play the DVD after entering your password
Set "LEVEL" to "OFF" in Step 7, then press ▷.

To change the password
1 After Step 3, select "CHANGE PASSWORD" using ↑/↓, then press → or ENTER.
The display for changing the password appears.
2 Follow Steps 2 and 3 to enter a new password.

Playing a disc which is blocked by the playback limitation level
1 Insert the disc and press ▷.
The PARENTAL CONTROL display appears.
2 Enter your 4-digit password using the number buttons, then press ENTER.
The player starts playback.
When you stop playing the DVD, the level returns to the original level.

If you forget your password
Enter the 6-digit number "199703" whenever the PARENTAL CONTROL display asks you for your password, then press ENTER. The display will ask you to enter a new 4-digit password.

Notes
- When you play DVDs which do not have the Parental Control function, playback cannot be limited on this player.
- If you do not set a password, you cannot change the settings for playback limitation.
- Depending on the DVD, you may be asked to change the parental control level while playing the disc. In this case, enter your password, then change the level.
When you stop playing the DVD, the level returns to the original level.
- The same password is used for both Parental Control and Custom Parental Control (page 37).

Standard	Code number
Argentina	2044
Australia	2047
Austria	2046
Belgium	2057
Brazil	2070
Canada	2079
Chile	2090
China	2092
Denmark	2115
Finland	2165
France	2174
Germany	2109
Hong Kong	2219
India	2248
Indonesia	2238
Italy	2254
Japan	2276
Korea	2304
Malaysia	2363
Mexico	2362
Netherlands	2376
New Zealand	2390
Norway	2379
Pakistan	2427
Philippines	2424
Portugal	2436
Russia	2489
Singapore	2501
Spain	2149
Sweden	2499
Switzerland	2086
Taiwan	2543
Thailand	2528
United Kingdom	2184

■ TRACK SELECTION

Gives the sound track which contains the highest number of channels priority when you play a DVD on which multiple audio formats (PCM, DTS, MPEG audio or Dolby Digital format) are recorded.

- OFF: No priority given.
- AUTO: Priority given.

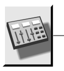
Notes

- When you set this item to “AUTO,” the language may change depending on the “AUDIO” settings in “LANGUAGE SETUP.” The “TRACK SELECTION” setting has higher priority than the “AUDIO” settings in “LANGUAGE SETUP” (page 59).
- If you set “DTS” in “AUDIO SETUP” to “OFF,” the DTS sound track is not played even if you set this item to “AUTO” and the highest-numbered audio channel is recorded in DTS format.
- If PCM, DTS, MPEG audio and Dolby Digital sound tracks have the same number of channels, the player selects PCM, DTS, Dolby Digital and MPEG audio sound tracks in this order.
- Depending on the DVD, the audio channel with priority may be predetermined. In this case, you cannot give priority to the DTS, MPEG audio or Dolby Digital format by selecting “AUTO.”

Settings for the Sound (AUDIO SETUP)

“AUDIO SETUP” allows you to set the sound according to the playback conditions.
The default settings are underlined.

Select “AUDIO SETUP” in the setup display.



AUDIO SETUP
AUDIO ATT: OFF
AUDIO DRC: STANDARD
DOWNMIX: DOLBY SURROUND
DIGITAL OUT: ON
DOLBY DIGITAL: D-PCM
MPEG: PCM
DTS: OFF
To set, press ←/↑/↓/→, then ENTER.
To quit, press DISPLAY.

■ AUDIO ATT (attenuation)

If the playback sound is distorted, set this item to “ON.” The player reduces the audio output level.
Selects the setting of the output from the AUDIO OUT connectors according to the audio equipment to be connected.

- OFF: turns off the audio attenuation. Normally select this position.
- ON: reduces the audio output level so that no sound distortion occurs. Select this when the playback sound from the built-in TV speakers is distorted.

Note

The setting does not affect the output from the DIGITAL OUT OPTICAL and COAXIAL connectors.

■ AUDIO DRC (Dynamic Range Control)

Makes the sound clear when the volume is turned down when playing a DVD. This function works only when you play a DVD which has the AUDIO DRC function.
This affects the output from the DIGITAL OUT connectors only when “DOLBY DIGITAL” is set to “D-PCM” and “MPEG” is set to “PCM” in “DIGITAL OUT,” and it affects the output from the AUDIO OUT connectors.

- STANDARD: Normally select this position.
- TV MODE: makes the low sounds clear even if you turn the volumedown. It is especially recommended when you listen to the sound using the speakers of the TV.
- WIDE RANGE: It gives you the feeling of being at a live performance. When you use high quality speakers, it is more effective.

Note

When you play DVDs without the AUDIO DRC function, there may be no effect on the sound.

■ DOWNMIX

Switches the mixing down methods when you play a DVD on which rear signal components such as LS, RS or S are recorded in Dolby Digital format. For details on the rear signal components, see “Displaying the audio information of the disc” (page 32).
The “DOWNMIX” setting affects the following connectors:

– AUDIO OUT connectors
– DIGITAL OUT OPTICAL and COAXIAL connectors (when you set “DOLBY DIGITAL” to “D-PCM” in “AUDIO SETUP” in the setup display)

- DOLBY SURROUND: when the player is connected to an audio component that conforms to Dolby Surround (Pro Logic). The output signals which reproduce the Dolby Surround (Pro Logic) effect are mixed down to 2 channels.
- NORMAL: when the player is connected to an audio component that does not conform to Dolby Surround (Pro Logic). The signals without the Dolby Surround (Pro Logic) effect are output.

■ DIGITAL OUT

Selects output signals via the DIGITAL OUT OPTICAL and COAXIAL connectors.

- ON: Normally select this position. When you select “ON,” set “DOLBY DIGITAL,” “MPEG” and “DTS.” For details on setting these items, see “Setting the Digital Output Signal.”
- OFF: when the player does not output the sound signals via the DIGITAL OUT OPTICAL and COAXIAL connectors, the influence of the digital circuit upon the analog circuit is at a minimum.

Notes

- When you play sound tracks with a 96 kHz sampling frequency, the output signals from the DIGITAL OUT (OPTICAL, COAXIAL) are converted to 48 kHz (sampling frequency). When the signals are output from the AUDIO OUT connectors, sampling frequency stays at 96 kHz and the output signals are converted to analog signals.
- When you select “OFF,” you cannot set “DOLBY DIGITAL” “MPEG” and “DTS.”

Setting the Digital Output Signal

Switches the methods of outputting audio signals when you, connect 1. a digital component such as a receiver (amplifier) having a digital connector, 2. an audio component having a built-in decoder (Dolby Digital, MPEG or DTS), 3. a DAT or MD via the DIGITAL OUT OPTICAL or COAXIAL connector using an optical or coaxial digital connecting cord. For connection details, see pages 12 and 14.
When you select “ON,” set “DOLBY DIGITAL,” “MPEG” and “DTS.”

AUDIO SETUP
AUDIO ATT: OFF
AUDIO DRC: STANDARD
DOWNMIX: DOLBY SURROUND
DIGITAL OUT: ON
DOLBY DIGITAL: D-PCM
MPEG: PCM
DTS: OFF
To set, press ←/↑/↓/→, then ENTER.
To quit, press DISPLAY.

■ DOLBY DIGITAL

Selects the Dolby Digital signals to be output via the DIGITAL OUT OPTICAL and COAXIAL connectors. You cannot select this item when you set “DIGITAL OUT” to “OFF.”

- D-PCM (Downmix PCM): when the player is connected to an audio component lacking a built-in Dolby Digital decoder. If you play Dolby Digital sound tracks, the output audio signals are mixed down to 2 channels. You can select whether the signals conform to Dolby Surround (Pro Logic) or not by making adjustments to the “DOWNMIX” item in “AUDIO SETUP.”
- DOLBY DIGITAL: when the player is connected to an audio component with a built-in Dolby Digital decoder. If the player is connected to an audio component lacking a built-in Dolby Digital decoder, do not set this. Otherwise, when you play the Dolby Digital sound track, a loud noise or no sound will come out from the speakers, affecting your ears or causing the speakers to be damaged.

Note

When you select “D-PCM,” set Virtual Enhanced Surround (VES) to “OFF.” Otherwise, the player will not output signals from the DIGITAL OUT OPTICAL or COAXIAL connector.

■ MPEG

Selects the MPEG audio signals to be output via the DIGITAL OUT OPTICAL and COAXIAL connectors. You cannot select this item when you set “DIGITAL OUT” to “OFF.”

- PCM: when the player is connected to an audio component lacking a built-in MPEG decoder. If you play MPEG audio sound tracks, the player outputs stereo signals via the DIGITAL OUT OPTICAL and COAXIAL connectors.
- MPEG: when the player is connected to an audio component having a built-in MPEG decoder. If the player is connected to an audio component lacking a built-in MPEG decoder, do not set this. Otherwise, when you play the MPEG audio sound track, a loud noise or no sound will come out from the speakers, affecting your ears or causing the speakers to be damaged.

■ DTS

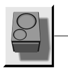
Selects the DTS signals to be output via the DIGITAL OUT OPTICAL and COAXIAL connectors. You cannot select this item when you set “DIGITAL OUT” to “OFF.”

- OFF: when the player is connected to an audio component lacking a built-in DTS decoder.
- ON: when the player is connected to an audio component having a built-in DTS decoder. If the player is connected to an audio component lacking a built-in DTS decoder, do not set this. Otherwise, when you play the DTS sound track, a loud noise or no sound will come out from the speakers, affecting your ears or causing the speakers to be damaged.

Subwoofer Set Up (SPEAKER SETUP)

When you have connected a subwoofer, specify the size of the front speakers you have connected to change the frequency range output from the subwoofer so that you can obtain the best possible surround sound.
Even if you change the “SUBWOOFER” setting, the sound output from the front speakers do not change.
For the speaker hookups, see pages 12 and 13.
The default settings are underlined.

Select “SPEAKER SETUP” in the setup display.



SPEAKER SETUP
SUBWOOFER: YES
FRONT SPEAKER SIZE: MIDDLE
To set, press ←/↑/↓/→, then ENTER.
To quit, press DISPLAY.

■ SUBWOOFER

Selects whether a subwoofer is connected to the player or not.

- NONE: when a subwoofer is not connected to the player.
- YES: when a subwoofer is connected to the player. When you select “YES,” set “FRONT SPEAKER SIZE.” For details, see “Setting the output level from the subwoofer.”

Setting the output level from the subwoofer

When you select “YES” in “SUBWOOFER” set “FRONT SPEAKER SIZE.” This selects the size of the connected front speakers. The frequency range output from the subwoofer varies according to the size of the front speakers.

■ FRONT SPEAKER SIZE

- LARGE: if you connect large speakers that will effectively reproduce bass frequencies and play a DVD recorded in 5.1 channels including an LFE signal, select this.
  If you feel a lack of bass frequencies from the front speakers when you select this, select “MIDDLE.”

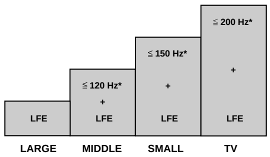
Notes

- If an LFE signal is not recorded on the disc, no sound will be output from the subwoofer even if you select “LARGE.”
- When you play MPEG audio sound track, an LFE signal is not output from the WOOFER connector.

- MIDDLE: if you connect large speakers that will effectively reproduce bass frequencies and play a source on which an LFE signal is not recorded, such as CD or DVD with 2 channels, select this to output the bass frequencies from the subwoofer as well as from the front channel.
  If you feel a lack of bass frequencies from the front speakers when you select this, select “SMALL.”
- SMALL: if you feel a lack of bass, select this to output even more bass frequencies from the subwoofer.
  If you still feel a lack of bass frequencies from the front speakers when you select this, select “TV.”
- TV: if you use the speakers of the TV or small speakers, select this to output the bass frequencies from the subwoofer.

The subwoofer outputs the LFE signal and the frequency range according to the FRONT SPEAKER SIZE setting

The LFE signal is output only when the disc contains an LFE signal.



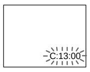
* Audio signal besides LFE

Note

The signals of the PCM sound tracks with a 96 kHz sampling frequency are not output from the WOOFER connector.

Self-diagnosis function

When the self-diagnosis function activates to prevent the player from malfunctioning, a five-character service number (combination of a letter and digits) flashes on the screen and on the front panel display. In this case, check the following table.



First three characters	Cause and/or Corrective Action
C13	• The disc is dirty. ➡ Clean the disc with a cleaning cloth. (page 6)
C31	• The disc is not inserted correctly. ➡ Open the disc tray and insert the disc correctly.
Exx (xx is any number)	• To prevent a malfunction, the player has performed the self-diagnosis function. ➡ When you contact your Sony dealer or local authorized Sony service facility, give the 5-character service number. (example: E:61:10)

Language Code List

For details, see page 33, 59.

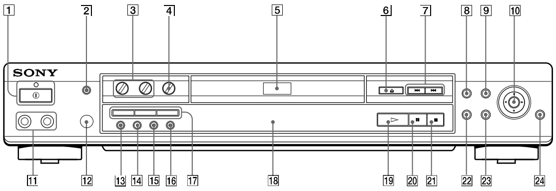
The language spellings conform to the ISO 639: 1988 (E/F) standard.

Code	Language	Code	Language	Code	Language	Code	Language
1027	Afar	1186	Scots Gaelic	1350	Malayalam	1513	Siswati
1028	Abkhazian	1194	Galician	1352	Mongolian	1514	Sesotho
1032	Afrikaans	1196	Guarani	1353	Moldavian	1515	Sundanese
1039	Amharic	1203	Gujarati	1356	Marathi	1516	Swedish
1044	Arabic	1209	Hausa	1357	Malay	1517	Swahili
1045	Assamese	1217	Hindi	1358	Maltese	1521	Tamil
1051	Aymara	1226	Croatian	1363	Burmese	1525	Telugu
1052	Azerbaijani	1229	Hungarian	1365	Nauru	1527	Tajik
1053	Bashkir	1233	Armenian	1369	Nepali	1528	Thai
1057	Byelorussian	1235	Interlingua	1376	Dutch	1529	Tigrinya
1059	Bulgarian	1239	Interlingue	1379	Norwegian	1531	Turkmen
1060	Bihari	1245	Inupiak	1393	Occitan	1532	Tagalog
1061	Bislama	1248	Indonesian	1403	(Afan) Oromo	1534	Setswana
1066	Bengali; Bangla	1253	Icelandic	1408	Oriya	1535	Tonga
1067	Tibetan	1254	Italian	1417	Punjabi	1538	Turkish
1070	Breton	1257	Hebrew	1428	Polish	1539	Tsonga
1079	Catalan	1261	Japanese	1435	Pashto; Pushto	1540	Tatar
1093	Corsican	1269	Yiddish	1436	Portuguese	1543	Twi
1097	Czech	1283	Javanese	1463	Quechua	1557	Ukrainian
1103	Welsh	1287	Georgian	1481	Rhaeto-Romance	1564	Urdu
1105	Danish	1297	Kazakh	1482	Kirundi	1572	Uzbek
1109	German	1298	Greenlandic	1483	Romanian	1581	Vietnamese
1130	Bhutani	1299	Cambodian	1489	Russian	1587	Volapük
1142	Greek	1300	Kannada	1491	Kinyarwanda	1613	Wolof
1144	English	1301	Korean	1495	Sanskrit	1632	Xhosa
1145	Esperanto	1305	Kashmiri	1498	Sindhi	1665	Yoruba
1149	Spanish	1307	Kurdish	1501	Sangho	1684	Chinese
1150	Estonian	1311	Kirghiz	1502	Serbo-Croatian	1697	Zulu
1151	Basque	1313	Latin	1503	Singhalese	1703	Not specified
1157	Persian	1326	Lingala	1505	Slovak		
1165	Finnish	1327	Laothian	1506	Slovenian		
1166	Fiji	1332	Lithuanian	1507	Samoan		
1171	Faroese	1334	Latvian; Lettish	1508	Shona		
1174	French	1345	Malagasy	1509	Somali		
1181	Frisian	1347	Maori	1511	Albanian		
1183	Irish	1349	Macedonian	1512	Serbian		

Index to Parts and Controls

Refer to the pages indicated in parentheses for details.

Front Panel



1 ⏻ **(power) button and indicator (17)**
Disconnects the power of the player or places the player in standby mode.

2 **VES (Virtual Enhanced Surround) button and indicator (36)**
Press to select the desired "VES" item. The indicator lights up for every selected item except "OFF."

3 **MIC 1 and 2 LEVEL controls (45)**
Adjusts the volume of the microphone connected to the MIC 1 and 2 connectors.

4 **ECHO LEVEL control (45)**
Adjusts the echo of the microphones connected to the MIC 1 and 2 connectors.

5 **Disc tray (17)**
Place a disc on the tray.

6 **⏏ OPEN/CLOSE button (17)**
Opens or closes the disc tray.

7 **⏮/⏭ PREV/NEXT (previous/next) buttons (18)**
Press to go to the next chapter or track, or to go back to the previous chapter or track.

8 **TITLE button (21)**
Displays the title menu on the TV screen.

9 **DVD MENU button (21)**
Displays the DVD menu on the TV screen.

10 **←/↑/↓/→/ENTER button**
Selects and executes the items or settings.

11 **MIC 1 and 2 connectors (45)**
Connect the microphones (not supplied) to these connectors. The player enters karaoke mode.

12 **(remote sensor) (7)**
Accepts the remote control signals.

13 **VOCAL button and indicator (50)**
Turns the Vocal function on and off in karaoke mode.

14 **VOCAL SELECT button (51)**
Selects different kinds of vocals recorded on the disc in karaoke mode.

15 **VOCAL SUPPORT button and indicator (52)**
Turns the Vocal Support function on and off in karaoke mode.

16 **KARAOKE STAR button and indicator (49)**
Press to select the effect to your voice in karaoke mode.

17 **KEY CONTROL buttons and indicators (48)**
Press to adjust the key to suit the vocal in karaoke mode.

18 **Front Panel Display (23)**
Indicates the playing time, etc.

19 **▷ (play) button (17)**
Plays a disc.

20 **❚❚ (pause) button (18)**
Pauses playing a disc.

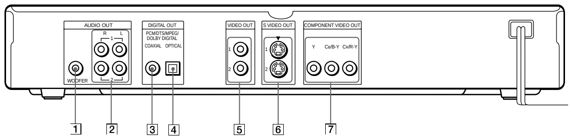
21 **■ (stop) button (18, 20)**
Stops playing a disc.

22 **DISPLAY button (25)**
Displays the Control Menu display on the TV screen to set or adjust the Control Menu items.

23 **↶RETURN button (22, 26)**
Press to return to the previously selected screen, etc.

24 **RESERVE button and indicator (54)**
Displays the "RESERVE" list on the TV screen in karaoke mode.

Rear Panel



1 **AUDIO OUT WOOFER connector (12)**
Connect to a subwoofer (not supplied).

2 **AUDIO OUT R (right)/L (left), 1/2 connectors (8, 10, 12)**
Connect to the audio input connector on your TV or receiver (amplifier).

3 **DIGITAL OUT COAXIAL connector (10, 14)**
Connect to an audio component using a coaxial digital connecting cord.

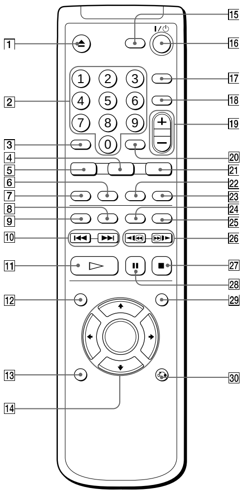
4 **DIGITAL OUT OPTICAL connector (10, 14)**
Connect to an audio component using an optical digital connecting cord. Take off the cap.

5 **VIDEO OUT 1/2 connectors (8)**
Connect to the video input connector on your TV or monitor.

6 **S VIDEO OUT 1/2 connectors (8, 10, 12)**
Connect to the S video input connector on your TV or monitor.

7 **COMPONENT VIDEO OUT connectors (9)**
Connect to a monitor or projector having component video input connectors (Y, CB/B-Y, CR/R-Y) that conform to output signals from the player.

Remote



1 **⏏OPEN/CLOSE button (18)**
Opens or closes the disc tray.

2 **Number buttons**
Selects the items or settings.

3 **CLEAR button (28, 40)**
Press to return to continuous play, etc.

4 **ANGLE button (34)**
Changes the angles when playing a DVD.

5 **AUDIO button (31)**
Changes the sound while playing a DVD or VIDEO CD.

6 **KARAOKE STAR button (49)**
Press to select the effect to your voice in karaoke mode.

7 **KARAOKE PON button (49)**
Reduces the singer's voice recorded on the disc in karaoke mode.

8 **VOCAL SELECT button (51)**
Selects different kinds of vocals recorded on the disc in karaoke mode.

9 **VOCAL button (50)**
Turns the Vocal function on and off in karaoke mode.

10 **⏮/⏭PREV/NEXT (previous/next) buttons (18)**
Press to go to the next chapter or track, or to go back to the previous chapter or track.

11 **▷PLAY/SELECT button (17)**
Plays a disc.

12 **TITLE button (21)**
Displays the title menu on the TV screen.

13 **DISPLAY button (25)**
Displays the Control Menu display on the TV screen to set or adjust the items.

14 **←/↑/↓/→/ENTER buttons**
Selects and executes the items or settings.

15 **KARAOKE MODE button (45)**
Press to set the player to karaoke mode.

16 **I/⏻ (on/standby) button (17)**
Press to turn on the player or place it in standby mode after power is connected by pressing ① on the player.

17 **EFFECT MODE button (55)**
Press to insert applause with or without cheers while playing karaoke.

18 **EFFECT DO button (55)**
Press to insert applause whenever you want in karaoke mode.

19 **KEY buttons (48)**
Press to adjust the key to suit the vocal in karaoke mode.

20 **ENTER button**
Executes the items or settings.

21 **SUBTITLE button (33)**
Changes the subtitles when playing a DVD.

22 **PROGRAM/RESERVE button (28, 30)**
Displays the "PROGRAM" display on the TV screen. In karaoke mode, displays the "RESERVE" list.

23 **SEARCH MODE button (28, 30)**
Press to select the search mode (title, chapter, track, etc.).

24 **VOCAL SUPPORT button (52)**
Turns the Vocal Support function on and off in karaoke mode.

25 **TIME/TEXT button (23)**
Displays the playing time of the disc, etc., on the front panel display.

26 **◄◄/►► SCAN/SLOW buttons (19)**
Locate a point quickly while monitoring the picture or play a disc in slow motion.

27 **■STOP button (18, 20)**
Stops playing a disc.

28 **❚❚PAUSE button (18)**
Pauses playing a disc.

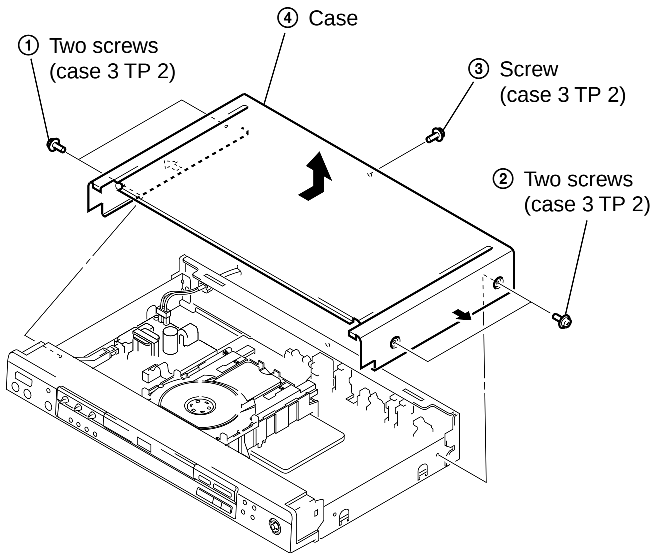
29 **DVD MENU button (21)**
Displays the DVD menu on the TV screen.

30 **↩RETURN button (22, 26)**
Press to return to the previously selected screen, etc.

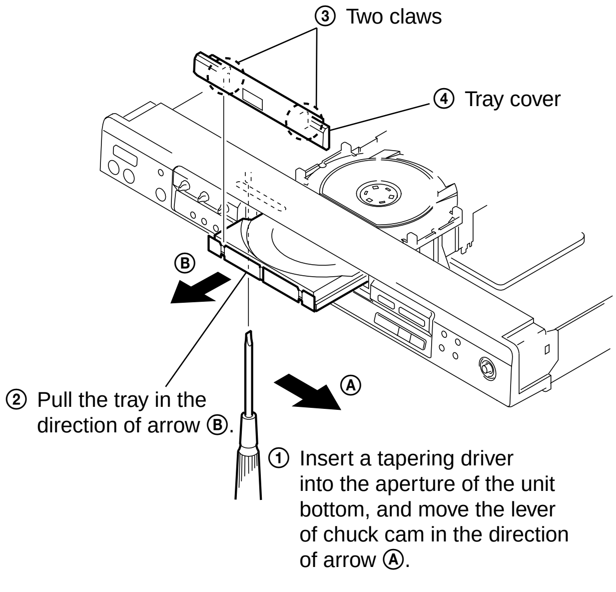
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

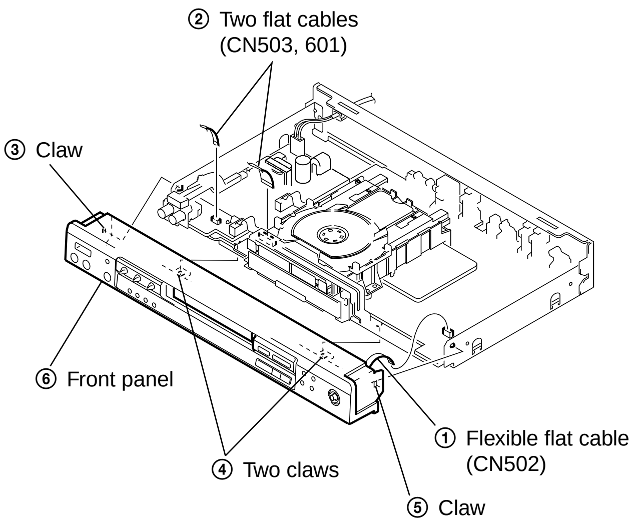
2-1. CASE REMOVAL



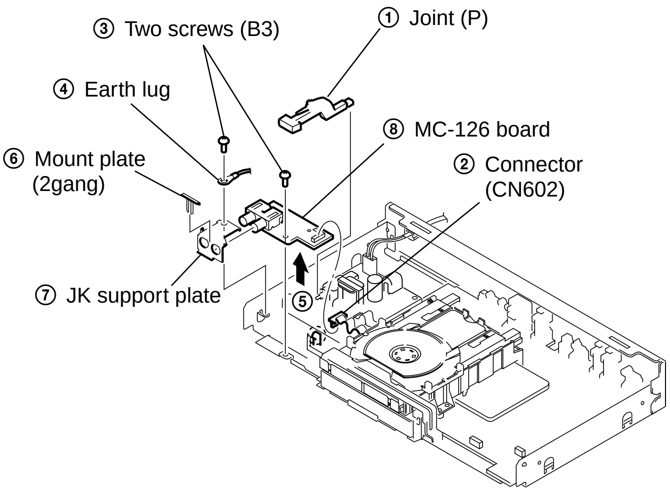
2-2. TRAY COVER REMOVAL



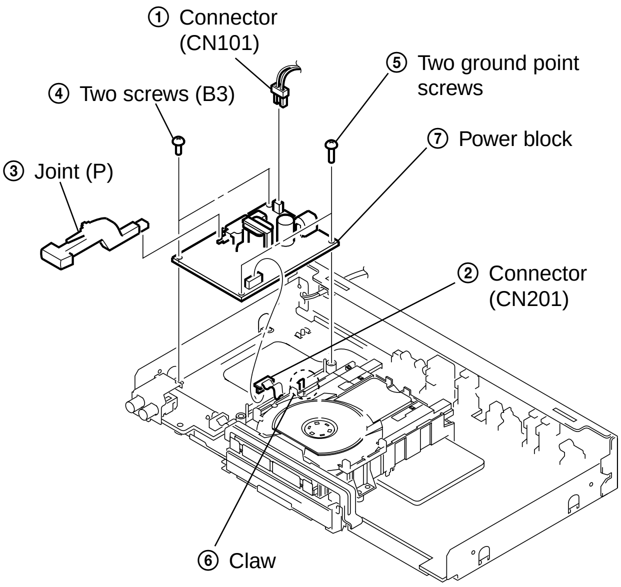
2-3. FRONT PANEL REMOVAL



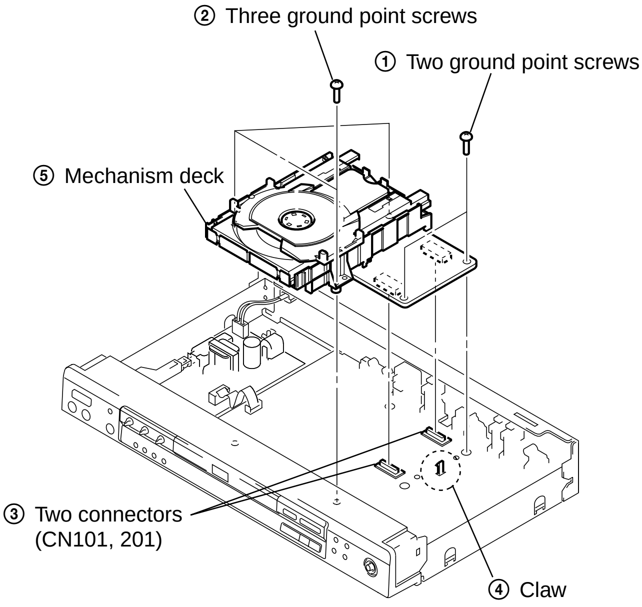
2-4. MC-126 BOARD REMOVAL



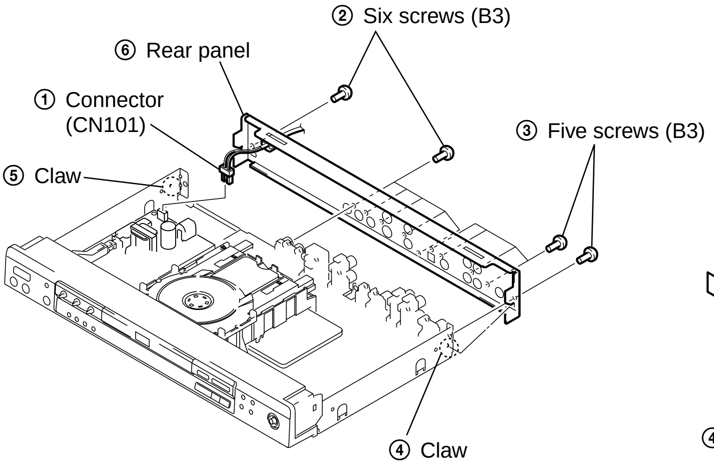
2-5. POWER BLOCK REMOVAL



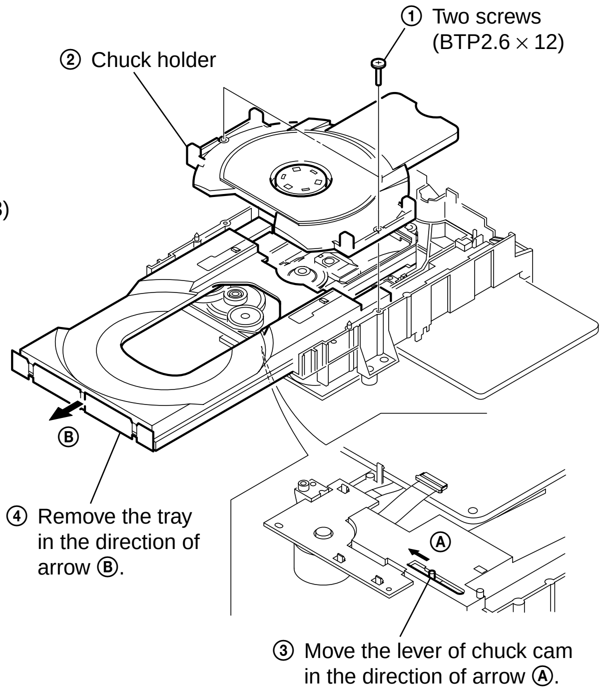
2-7. MECHANISM DECK REMOVAL



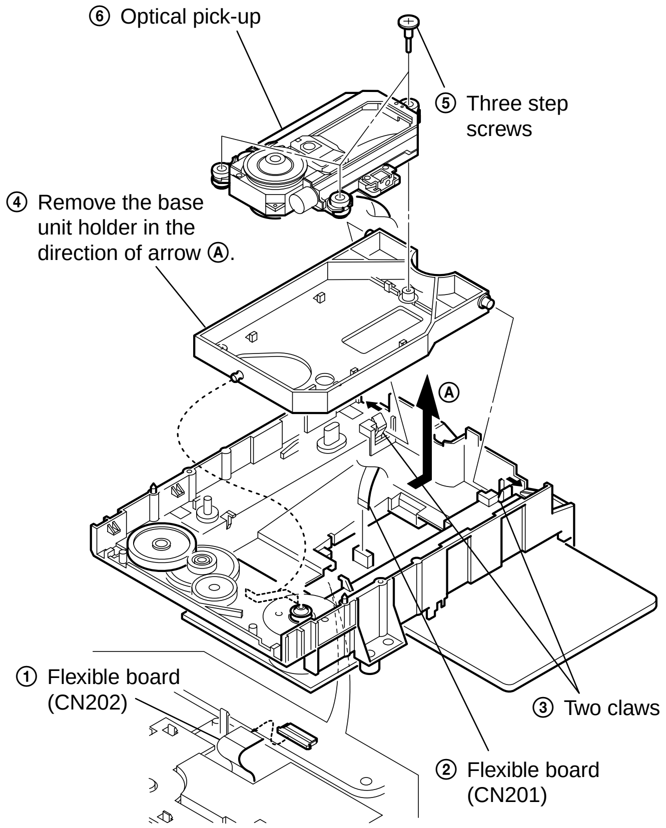
2-6. REAR PANEL REMOVAL



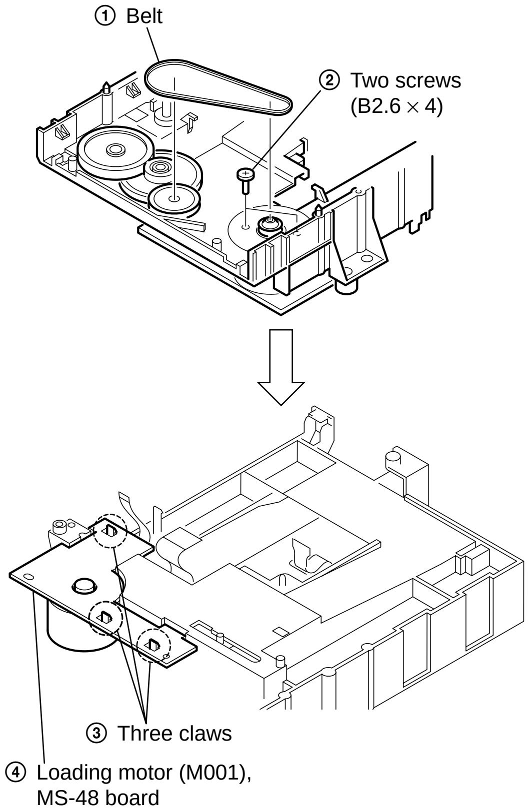
2-8. TRAY REMOVAL



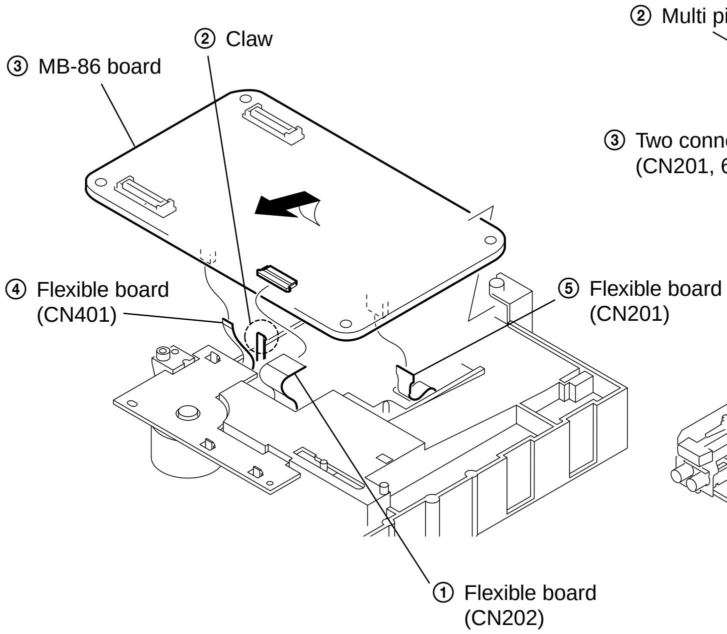
2-9. OPTICAL PICK-UP REMOVAL



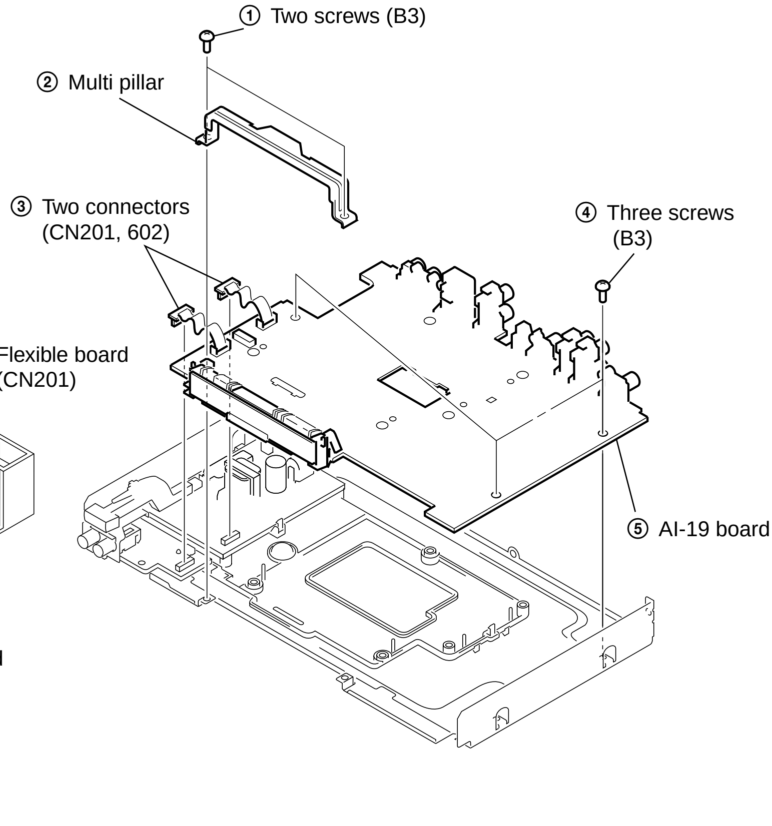
2-11. BELT, LOADING MOTOR (M001), MS-48 BOARD REMOVAL



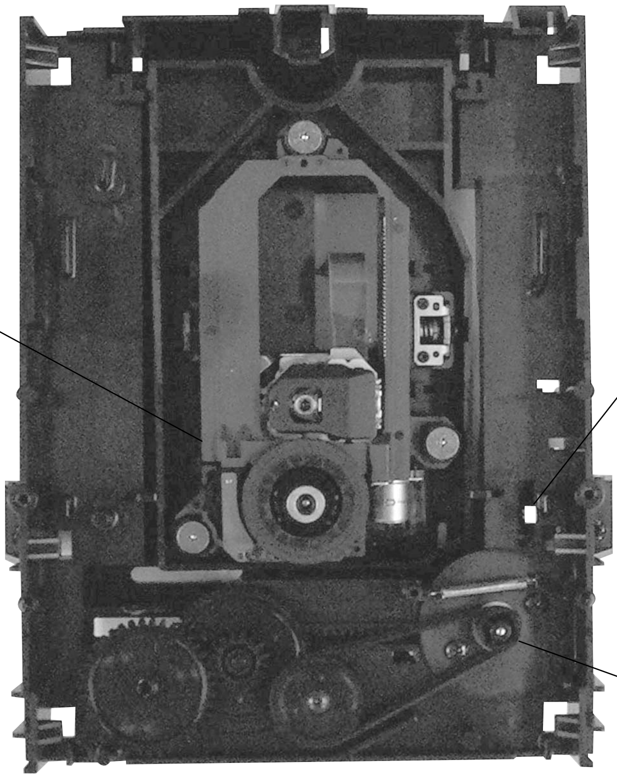
2-10. MB-86 BOARD REMOVAL

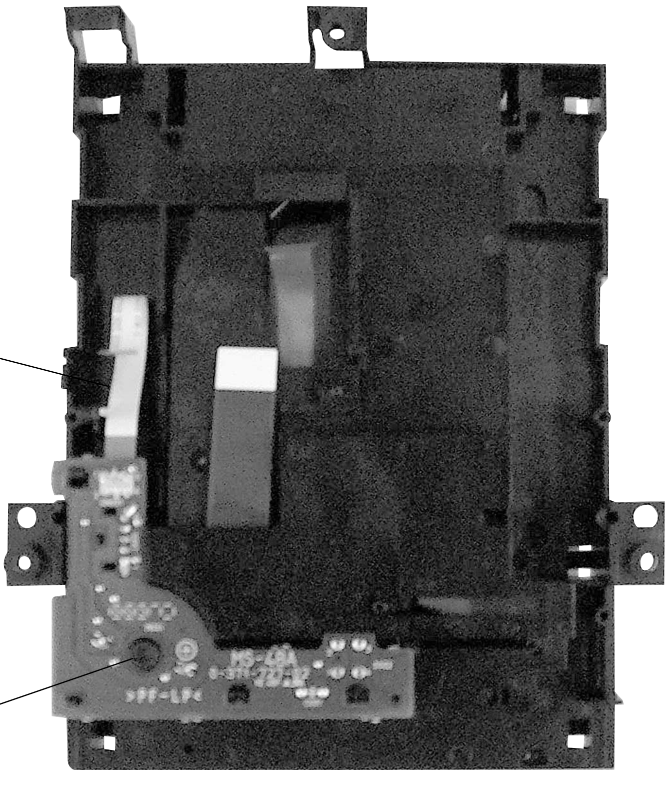


2-12. AI-19 BOARD REMOVAL

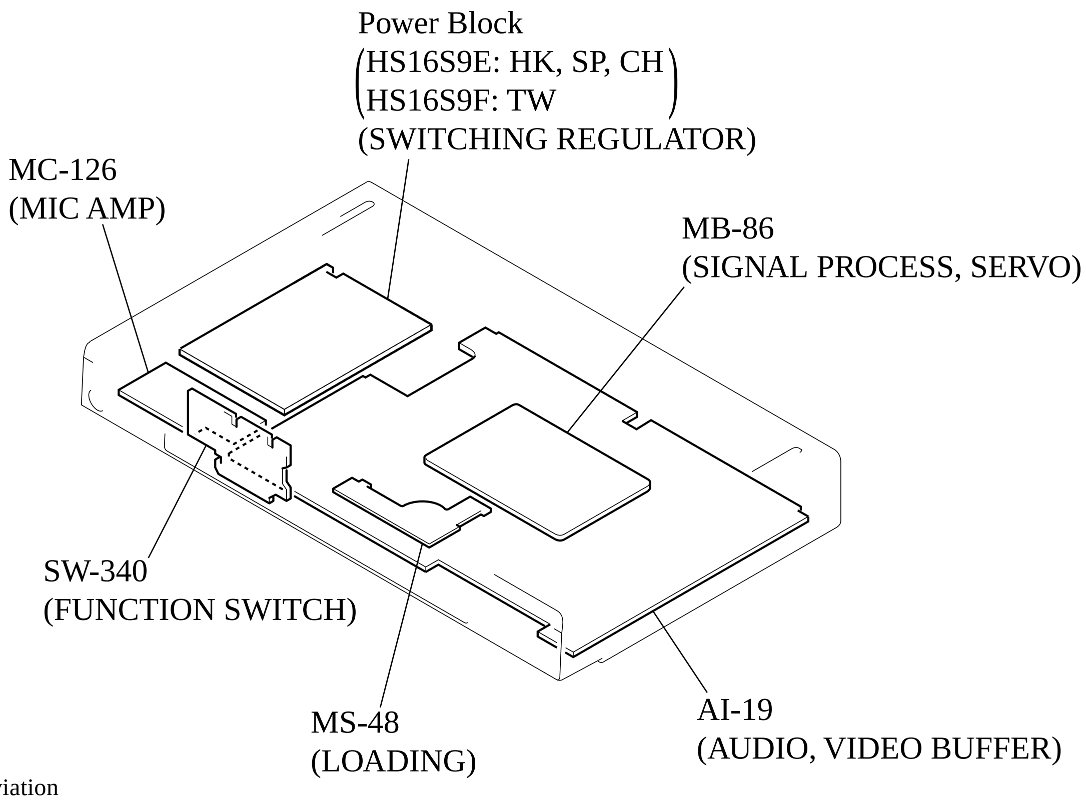


2-13. INTERNAL VIEWS





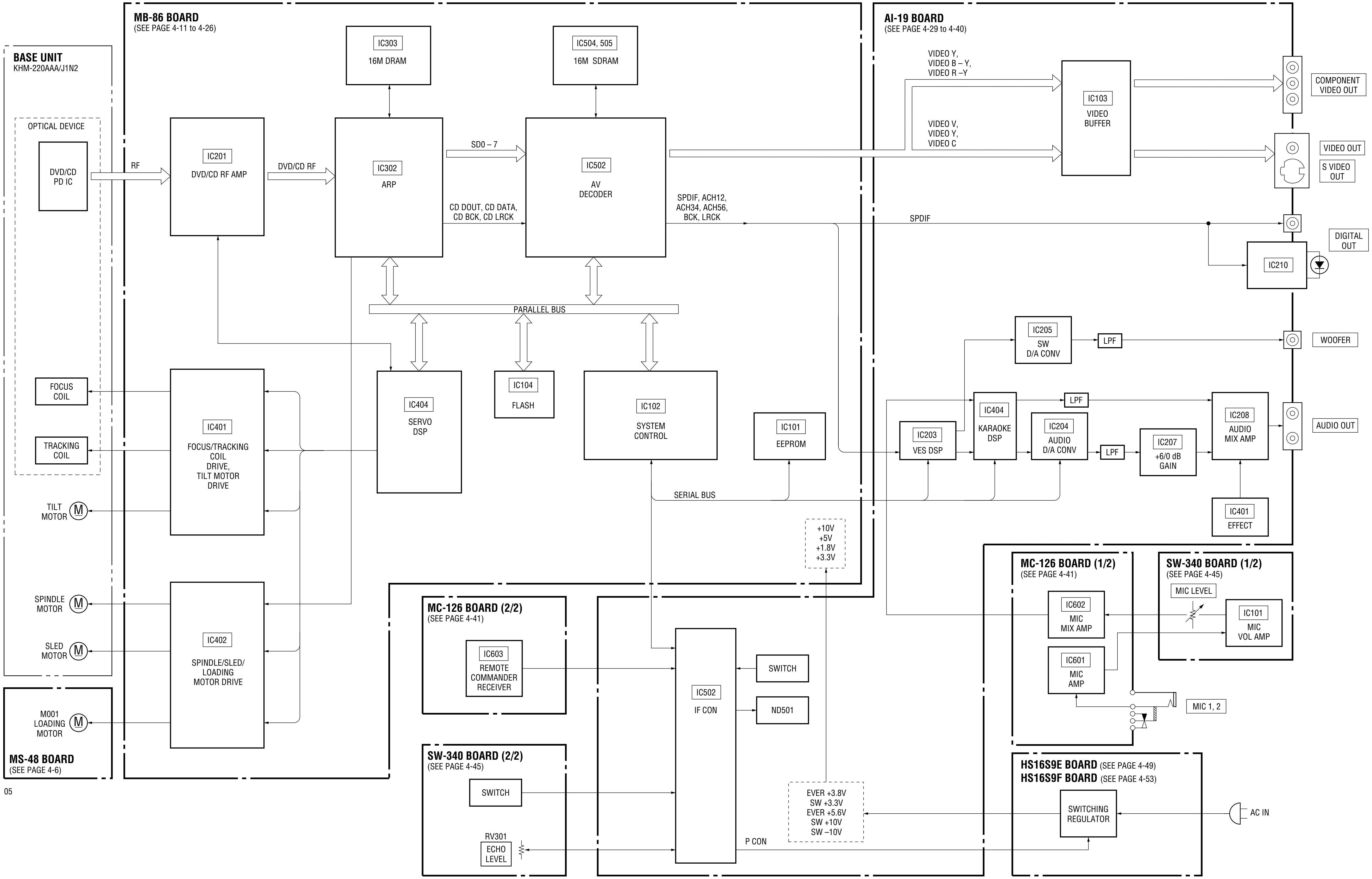
2-14. CIRCUIT BOARDS LOCATION



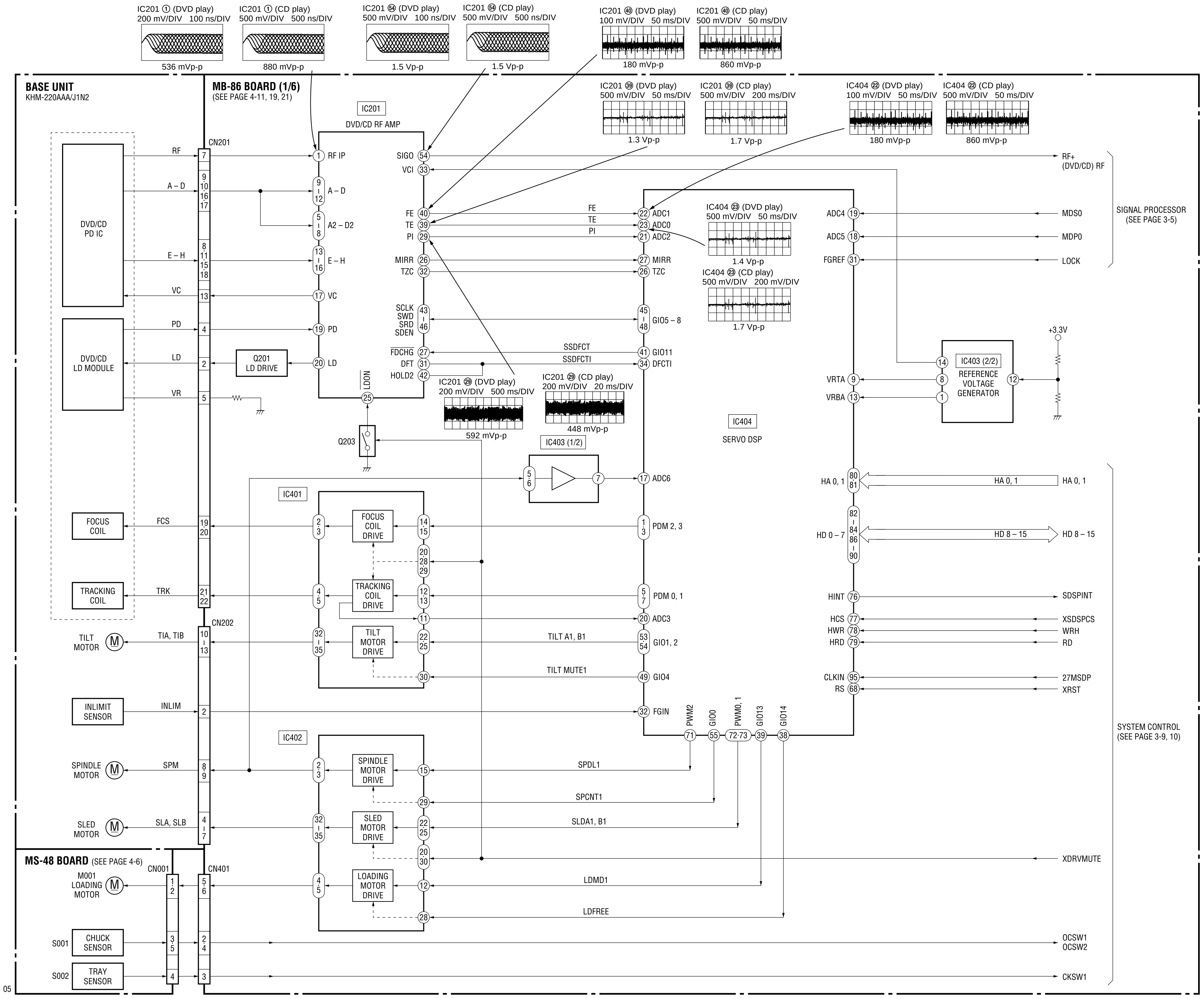
- Abbreviation
  CH : Chinese model
  HK : Hong Kong model
  SP : Singapore model
  TW : Taiwan model

SECTION 3
BLOCK DIAGRAMS

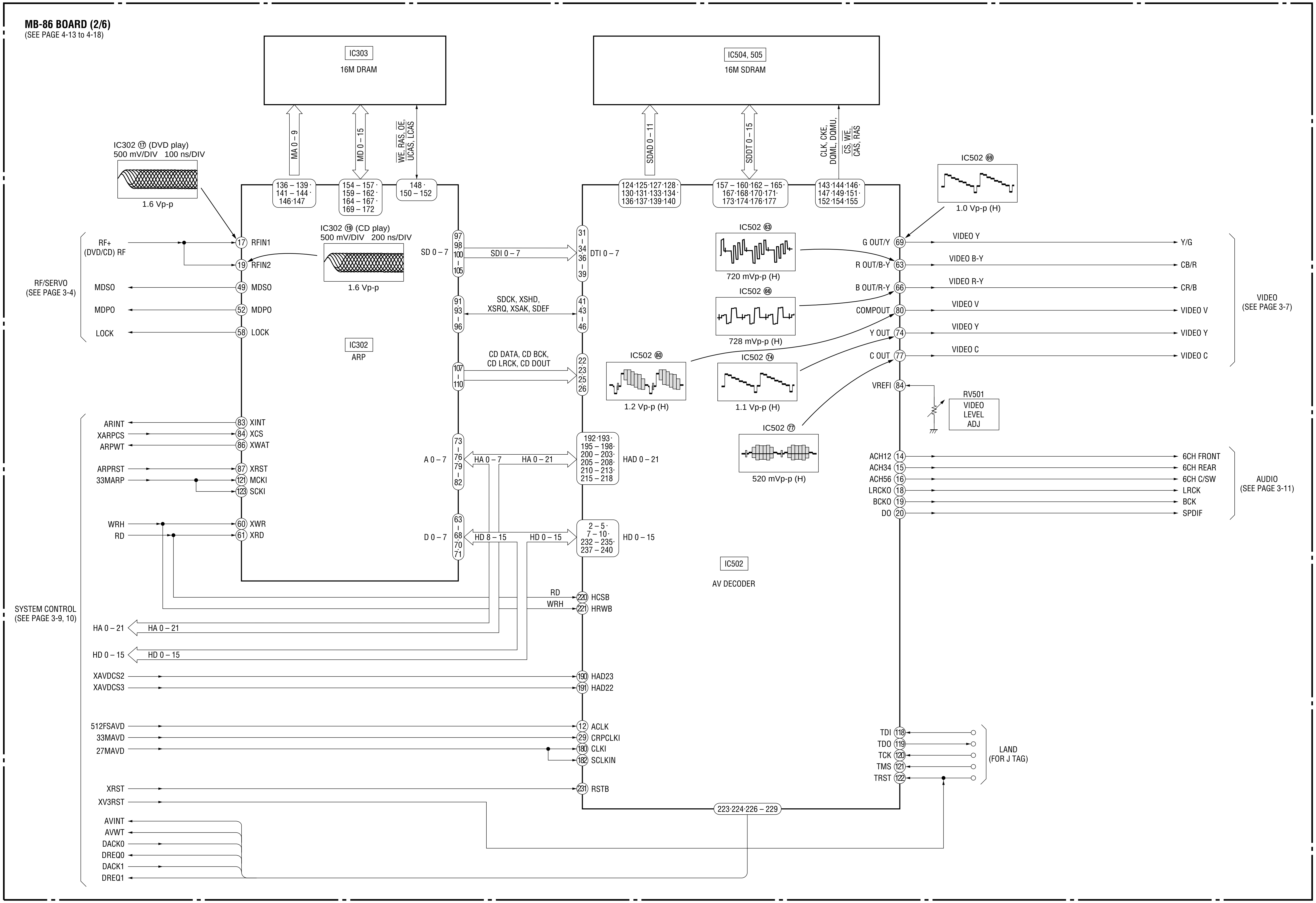
3-1. OVERALL BLOCK DIAGRAM



3-2. RF/SERVO BLOCK DIAGRAM

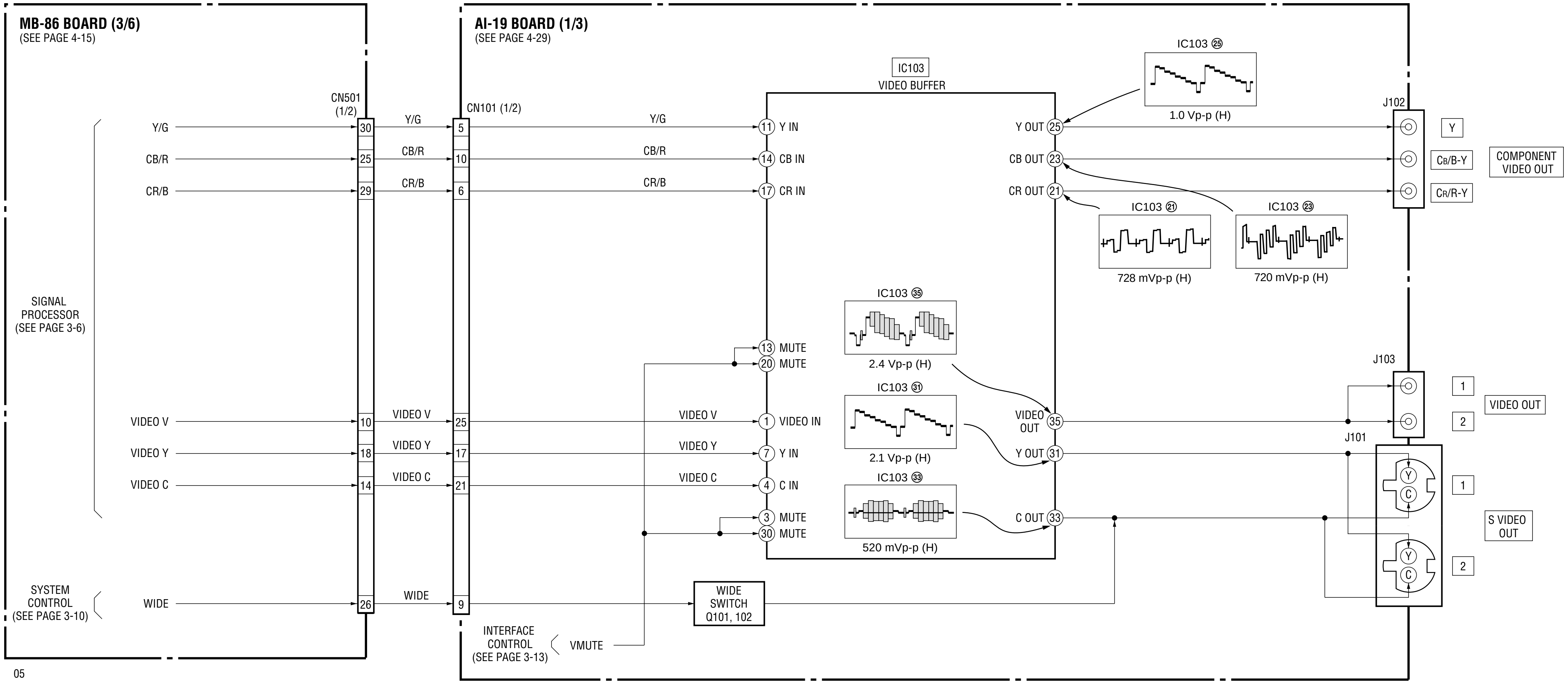


3-3. SIGNAL PROCESSOR BLOCK DIAGRAM

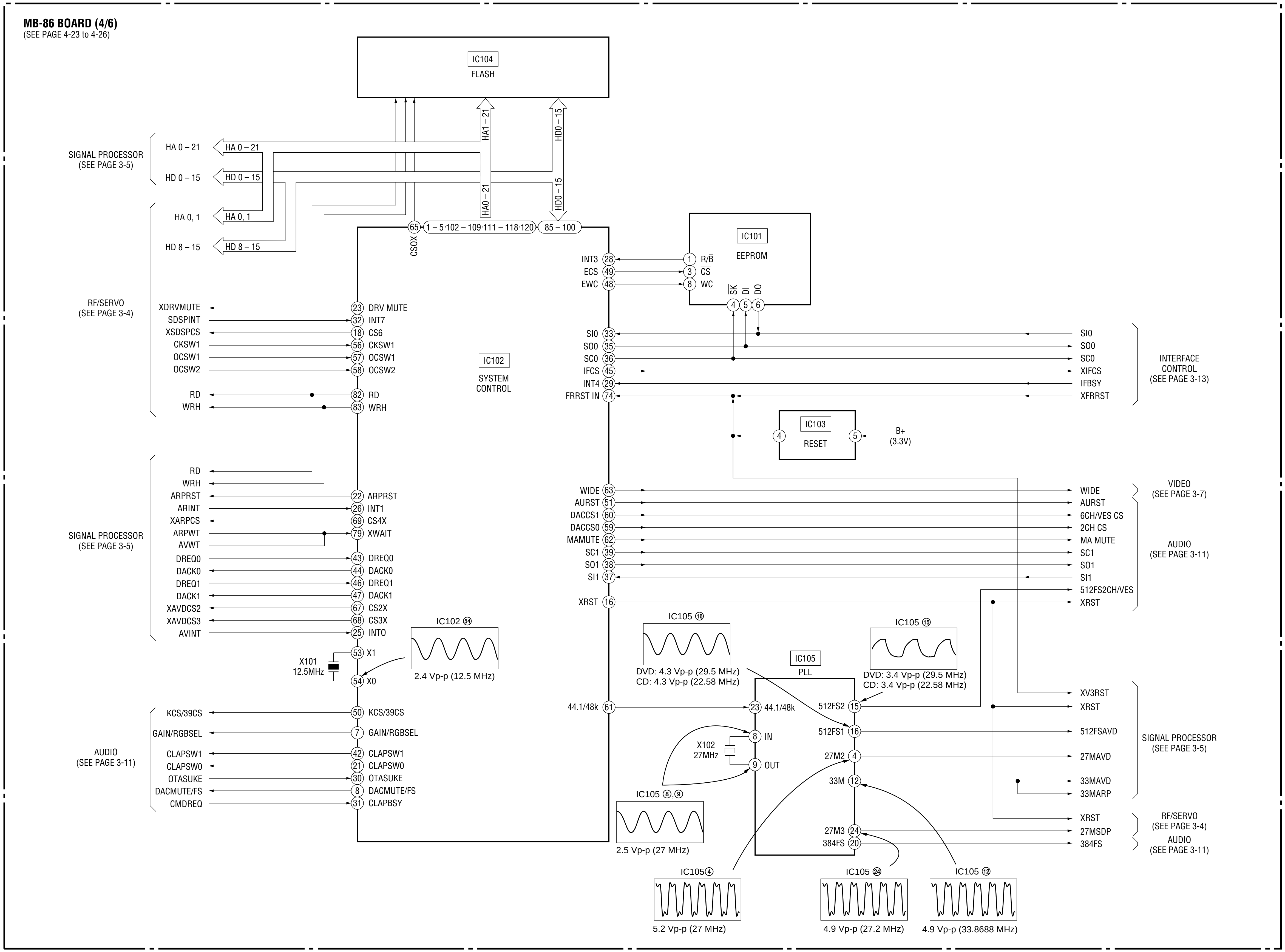


05

3-4. VIDEO BLOCK DIAGRAM

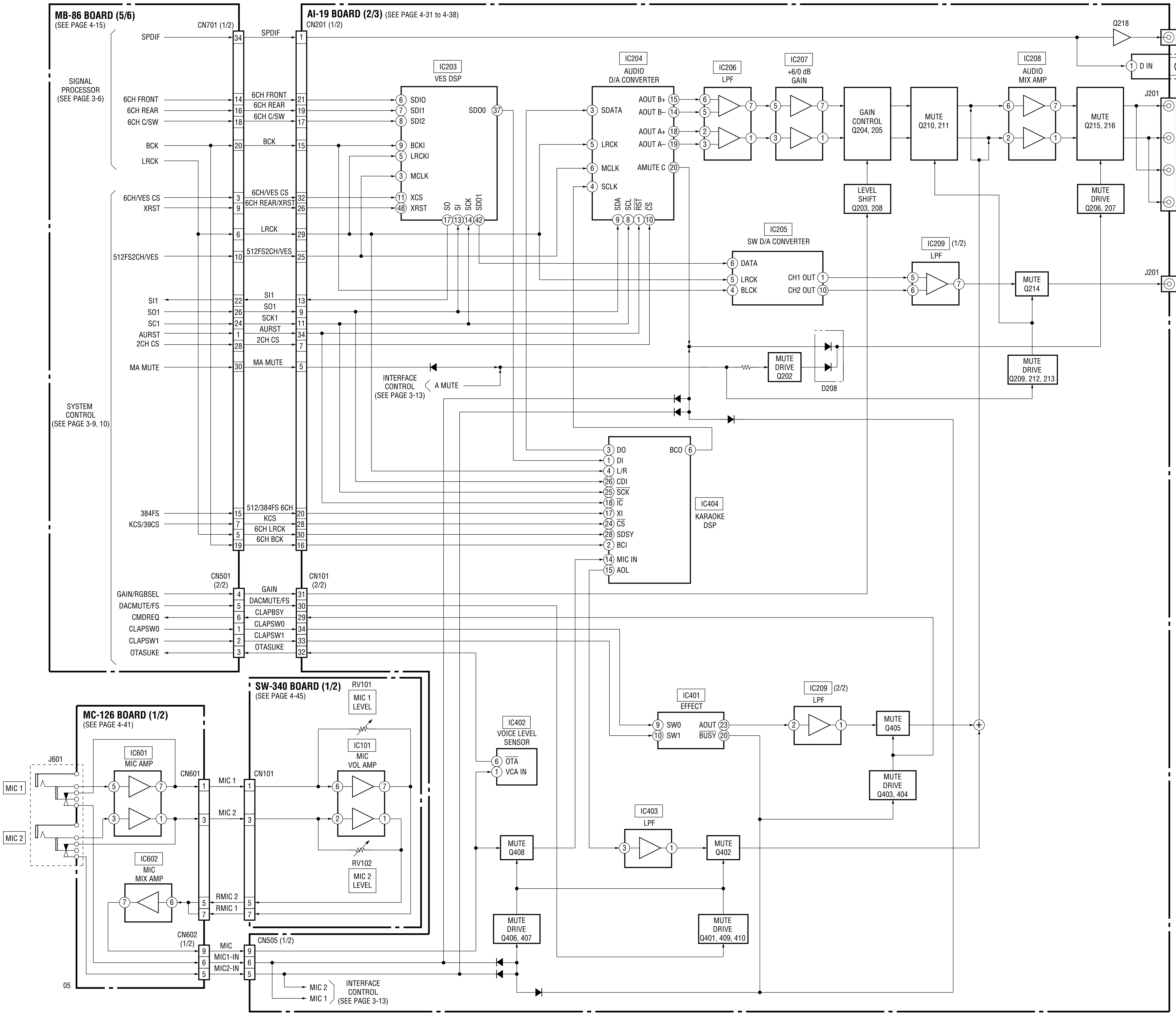


3-5. SYSTEM CONTROL BLOCK DIAGRAM

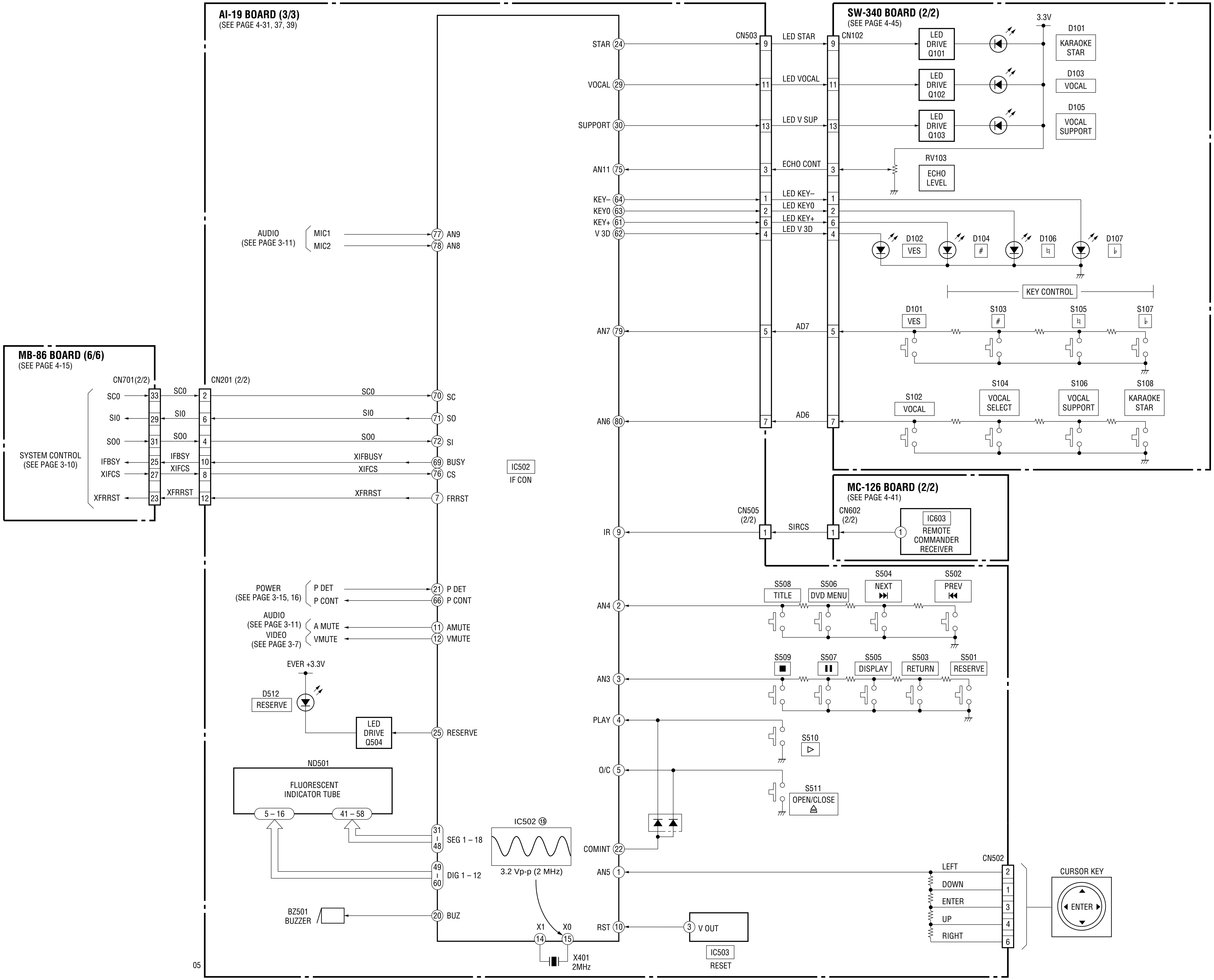


05

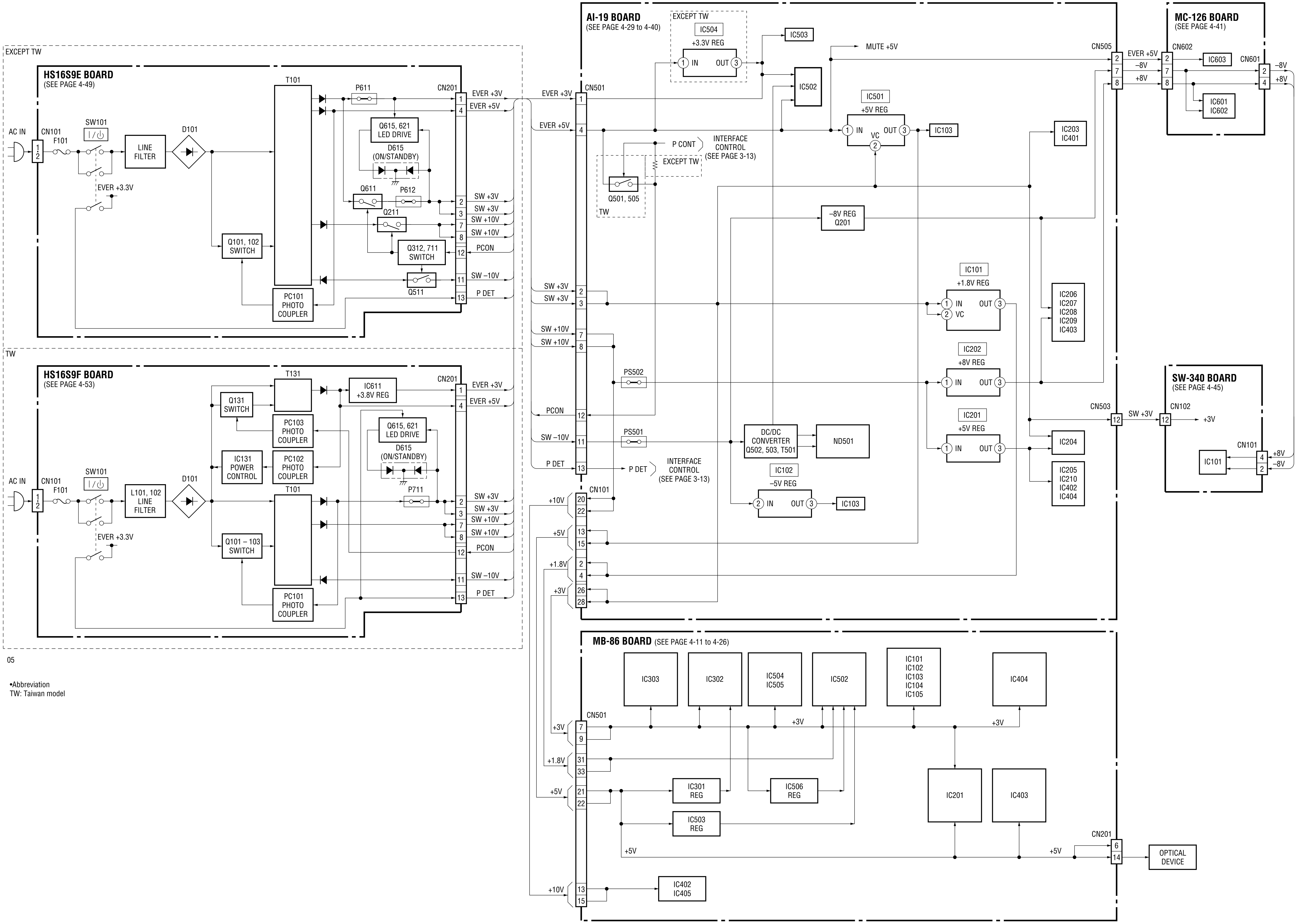
3-6. AUDIO BLOCK DIAGRAM



3-7. INTERFACE CONTROL BLOCK DIAGRAM



3-8. POWER BLOCK DIAGRAM



•Abbreviation
TW: Taiwan model

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For printed wiring boards:
- ○——— : indicates a lead wire mounted on the component side.
- ●——— : indicates a lead wire mounted on the printed side.
- ○ : Through hole.
- ░░░ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

- Abbreviation
  - CH : Chinese model
  - HK : Hong Kong model
  - SP : Singapore model
  - TW : Taiwan model

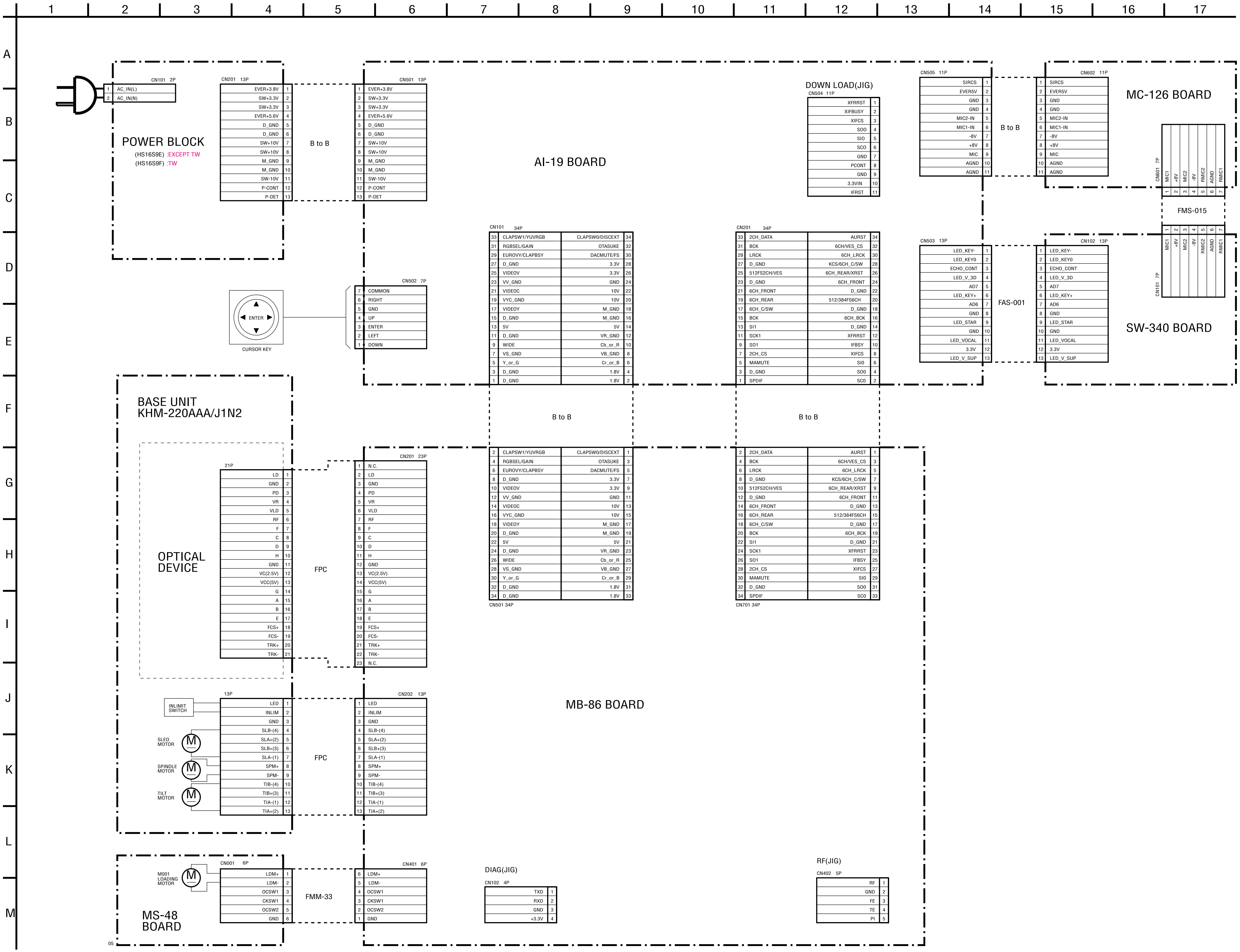
For schematic Diagram:
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, $^1/_4$ W (Chip resistors : $^1/_{10}$ W) unless otherwise specified.
  kΩ : 1000Ω, MΩ : 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- [symbol] : nonflammable resistor.
- [symbol] : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair.
- B+ : B+ Line.
- B– : B– Line.
- Circled numbers refer to waveforms.
- Voltages are dc between measurement point.
- Readings are taken with a color-bar signals on DVD reference disc and when playing CD reference disc.
- Readings are taken with a digital multimeter (DC 10MΩ).
- Voltage variations may be noted due to normal production tolerances.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Abbreviation
  - CH : Chinese model
  - HK : Hong Kong model
  - SP : Singapore model
  - TW : Taiwan model

4-1. FRAME SCHEMATIC DIAGRAM

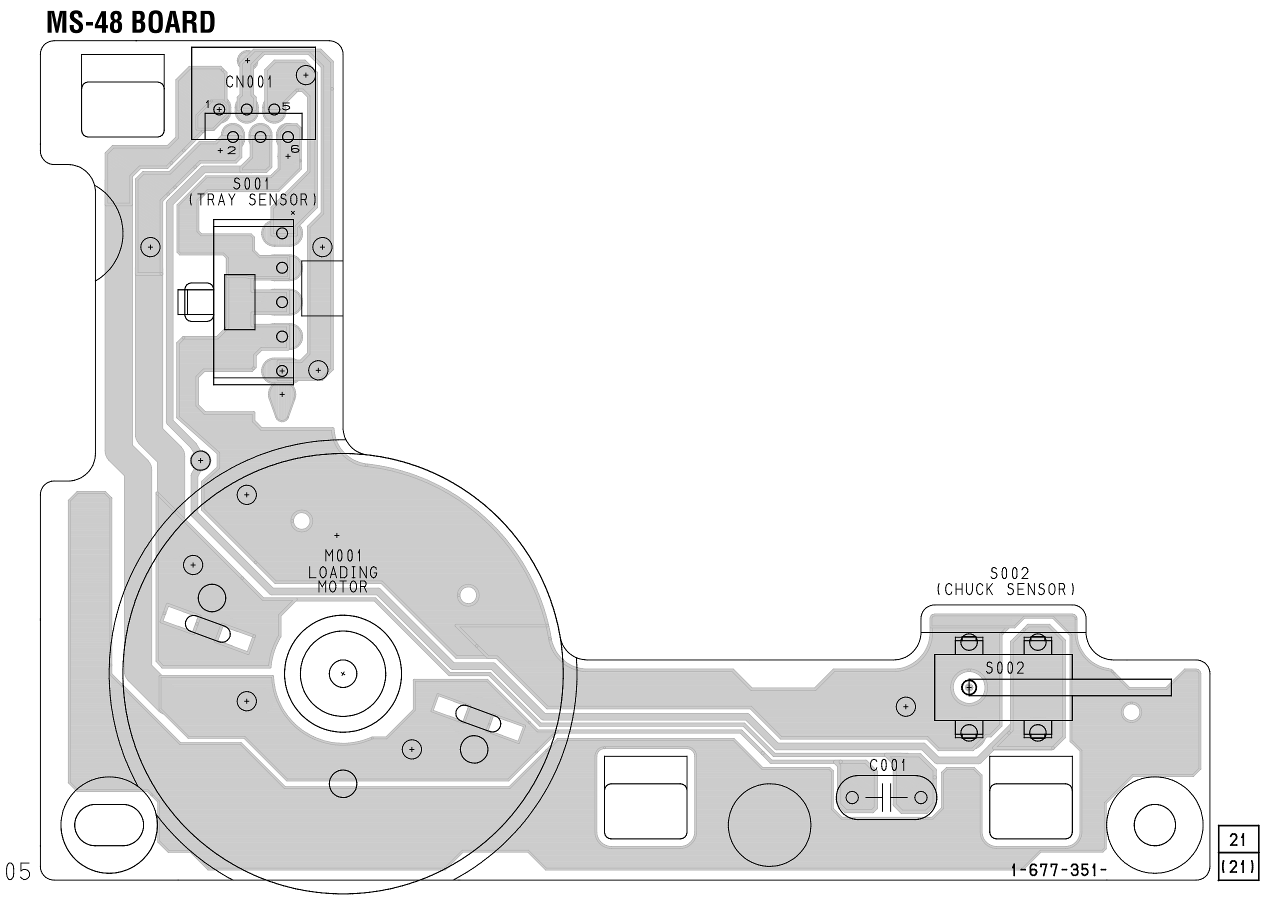


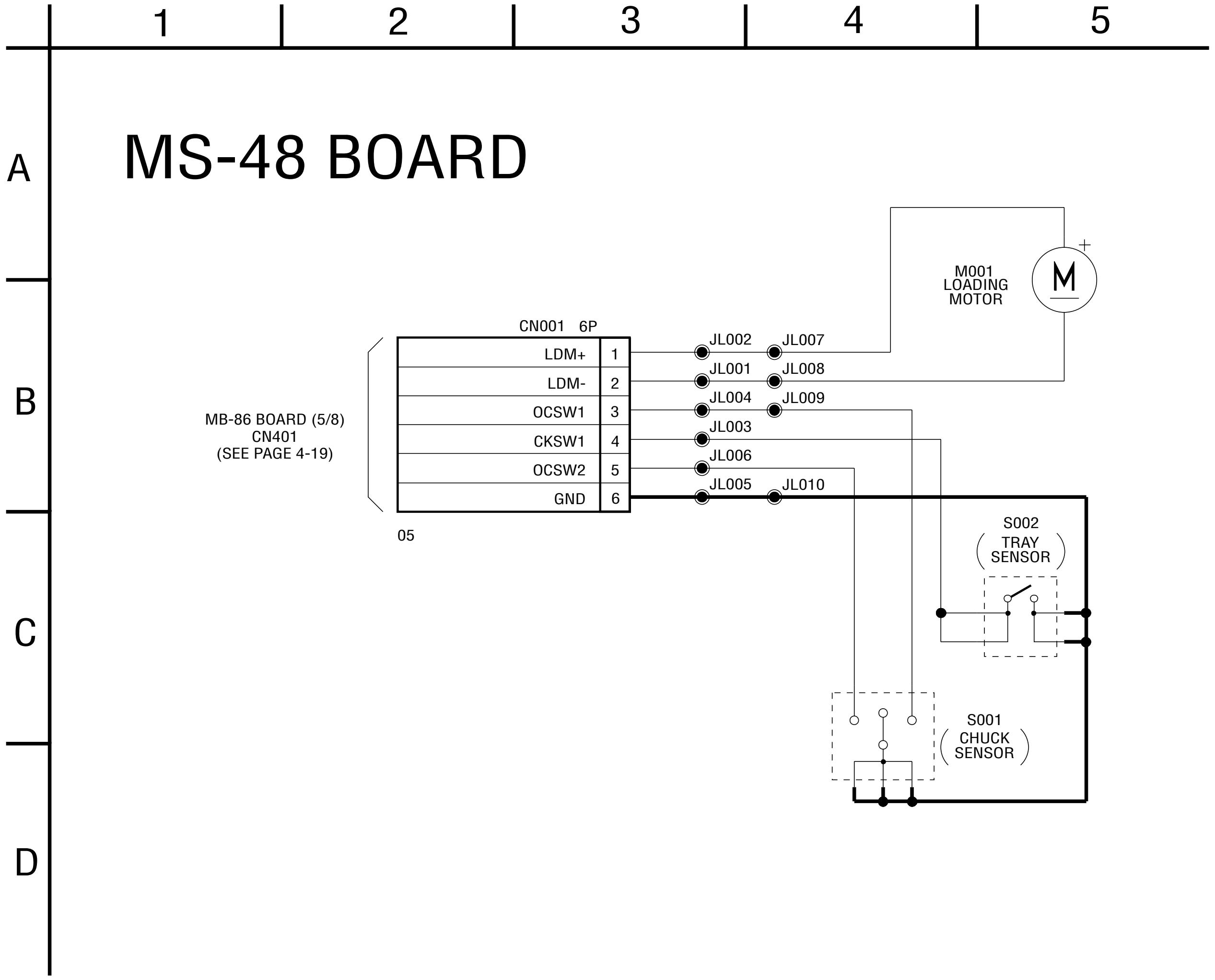
4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

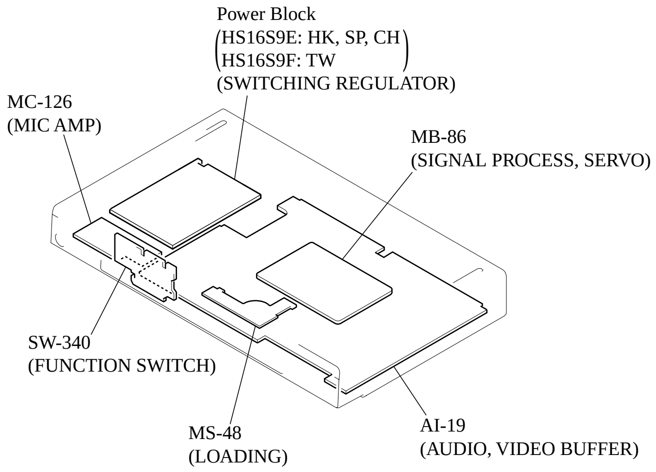
MS-48 (LOADING) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: MS-48 board; 2,000 series –

There are a few cases that the part isn't mounted in this model is printed on this diagram.







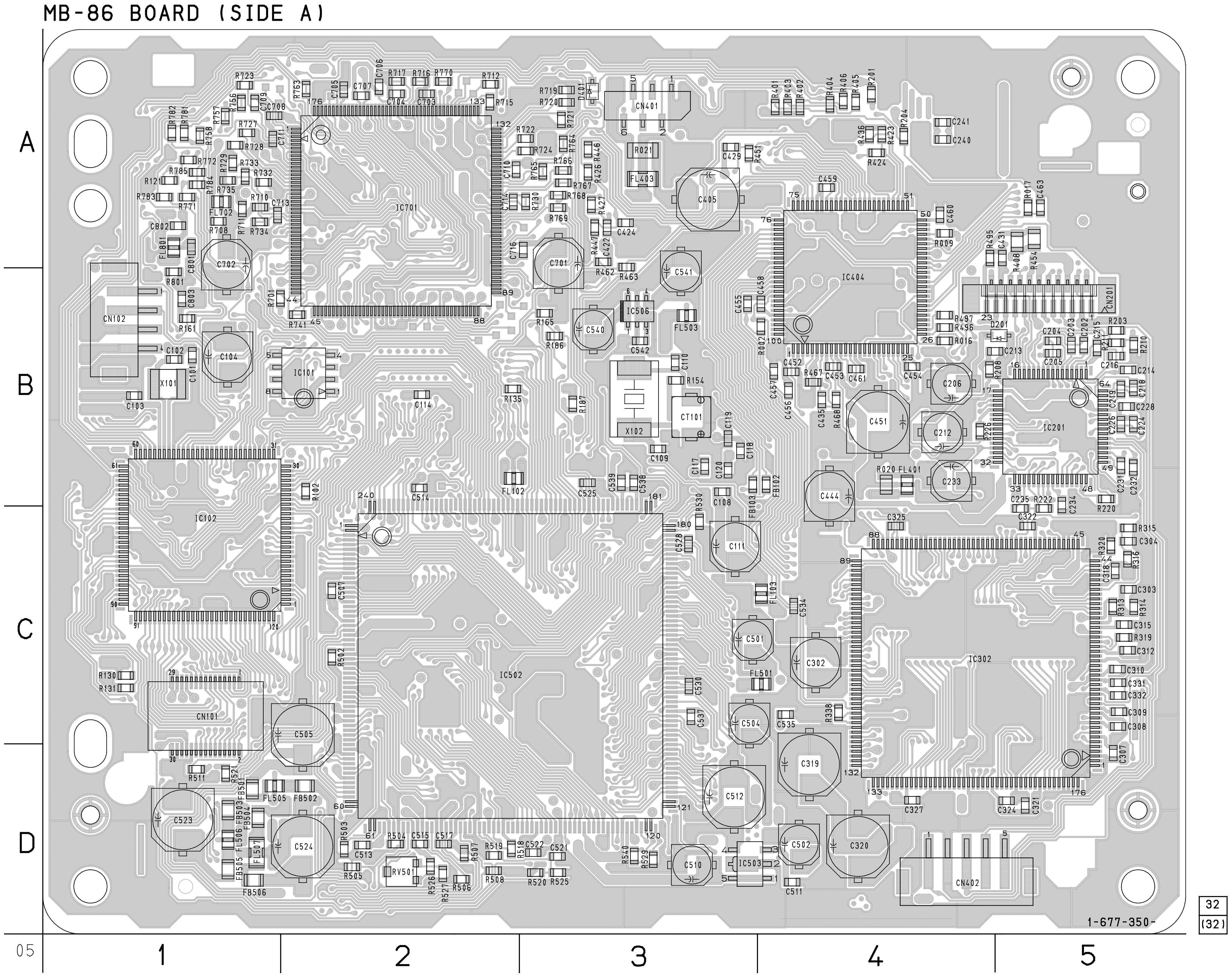
MB-86 (SIGNAL PROCESS, SERVO) PRINTED WIRING BOARD

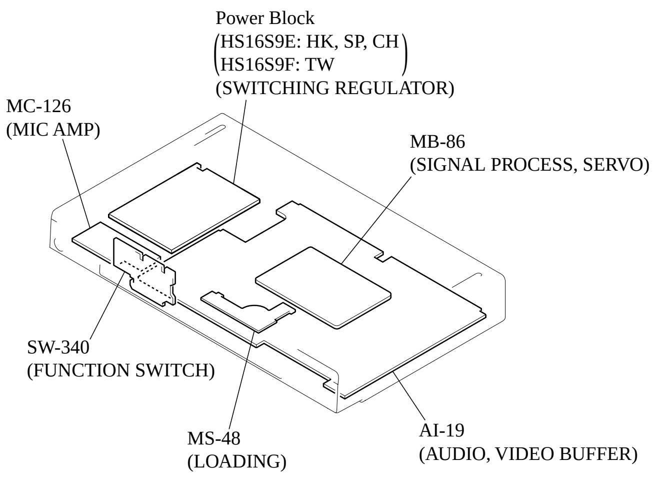
– Ref. No.: MB-86 board; 1,000 series –

There are a few cases that the part isn't mounted in this model is printed on this diagram.

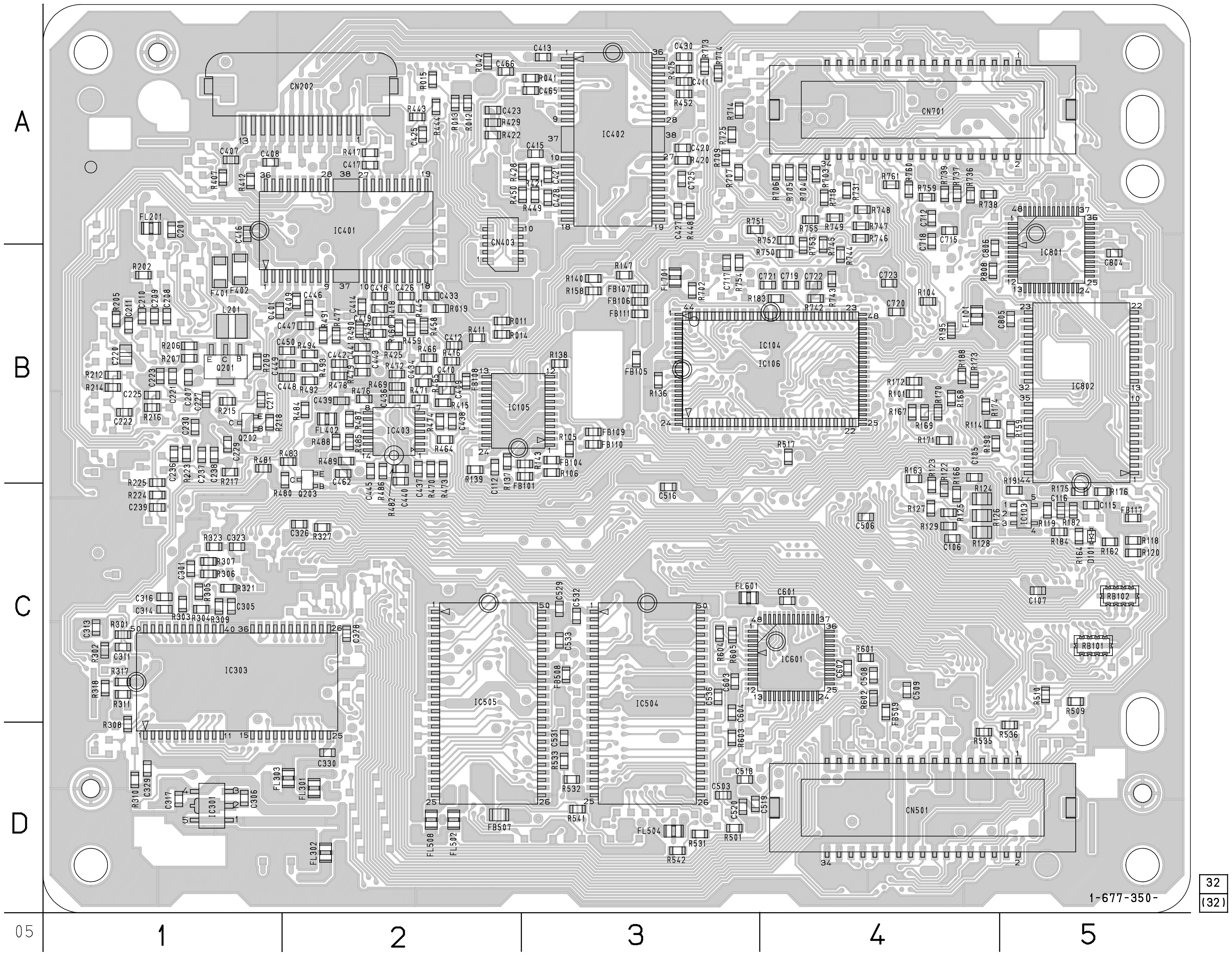
MB-86 BOARD (SIDE A)

CN102	B-1
CN201	B-5
CN401	A-3
CN402	D-4
D201	B-5
IC101	B-2
IC102	C-1
IC201	B-5
IC302	C-4
IC404	B-4
IC502	C-2
IC503	D-3
IC506	B-3





MB-86 BOARD (SIDE B)

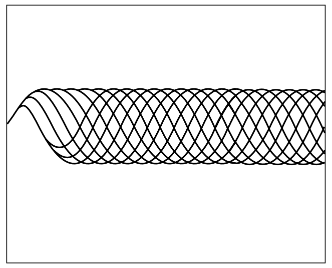


MB-86 BOARD (SIDE B)

CN202	A-2	IC303	C-1
CN501	D-4	IC401	A-2
CN701	A-4	IC402	A-3
		IC403	B-2
D101	C-5	IC504	C-3
		IC505	C-2
IC103	C-5		
IC104	B-4	Q201	B-1
IC105	B-2	Q203	B-1
IC301	D-1		

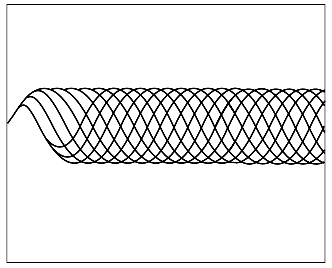
• **Waveforms**

❶ IC201 ① (DVD play)
200 mV/DIV 100 ns/DIV



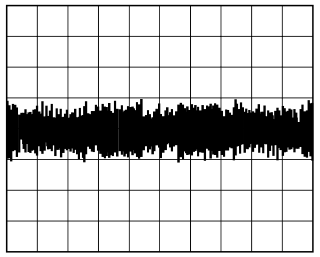
536 mVp-p

❶ IC201 ① (CD play)
500 mV/DIV 500 ns/DIV



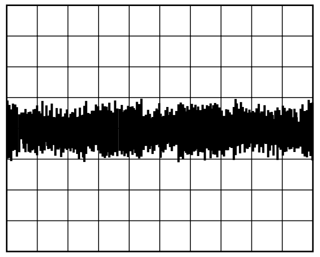
880 mVp-p

❷ IC201 ㉙ (DVD play)
200 mV/DIV 500 ms/DIV



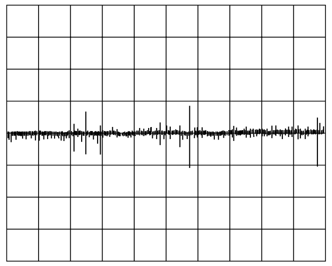
592 mVp-p

❷ IC201 ㉙ (CD play)
200 mV/DIV 20 ms/DIV



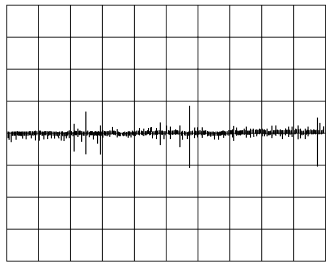
448 mVp-p

❸ IC201 ㊴ (DVD play)
500 mV/DIV 50 ms/DIV



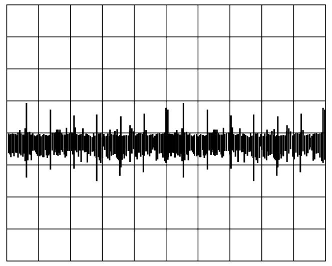
1.3 Vp-p

❸ IC201 ㊴ (CD play)
500 mV/DIV 200 ms/DIV



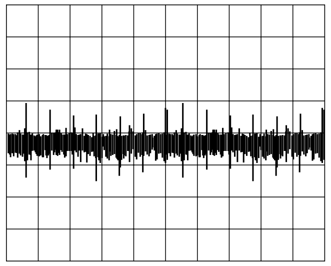
1.7 Vp-p

❹ IC201 ㊵ (DVD play)
100 mV/DIV 50 ms/DIV



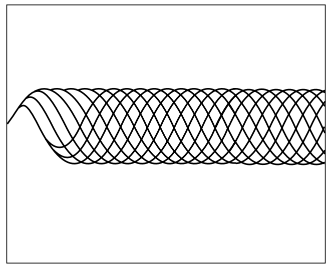
180 mVp-p

❹ IC201 ㊵ (CD play)
500 mV/DIV 50 ms/DIV



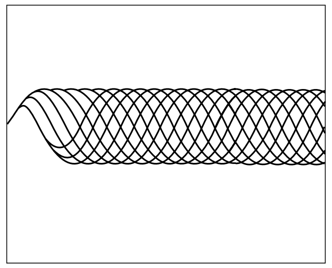
860 mVp-p

❺ IC201 (54) (DVD play)
500 mV/DIV 100 ns/DIV



1.5 Vp-p

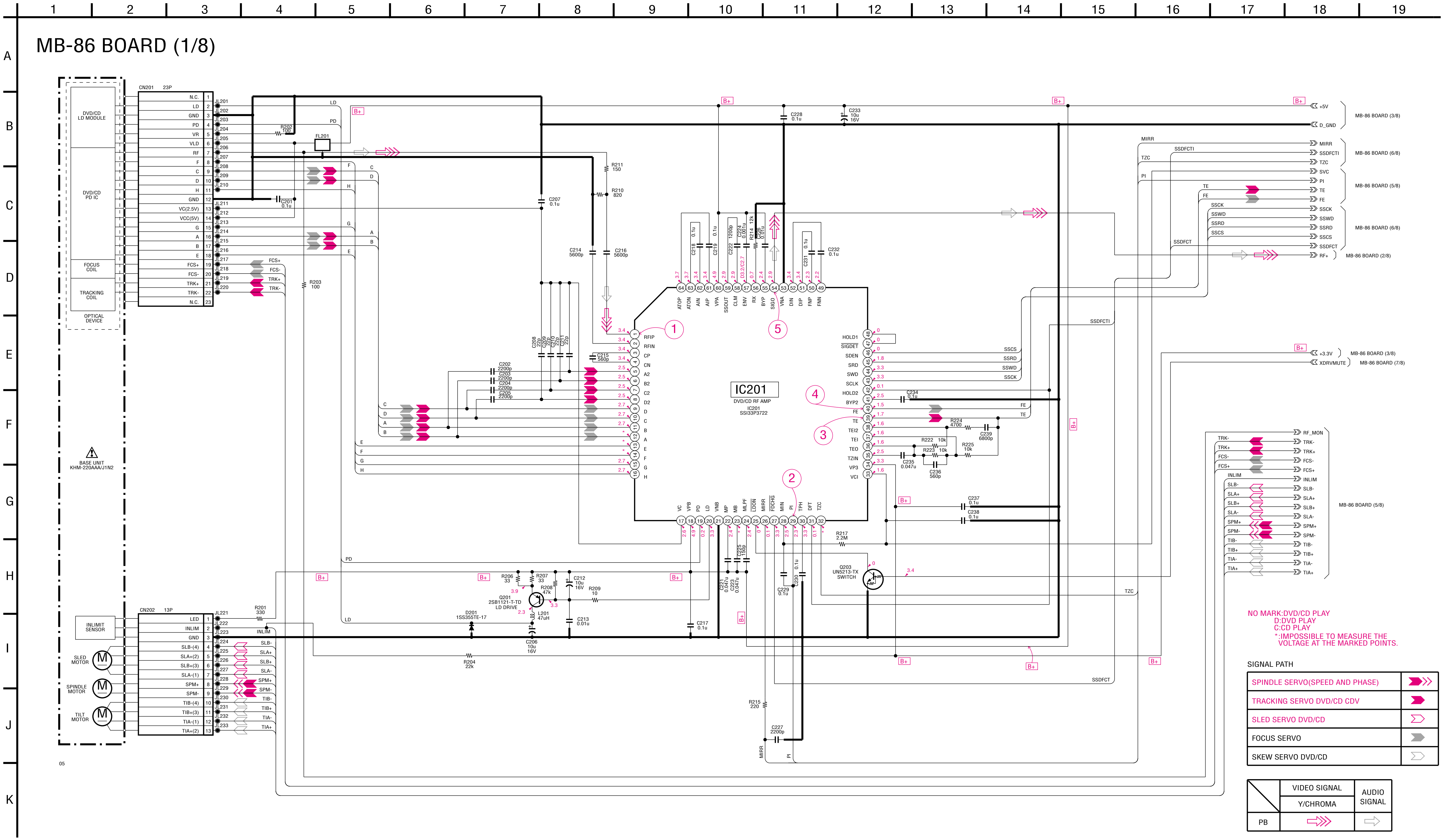
❺ IC201 (54) (CD play)
500 mV/DIV 500 ns/DIV



1.5 Vp-p

MB-86 (RF AMP, SERVO) SCHEMATIC DIAGRAM • See page 4-7 for printed wiring board and page 4-10 for waveforms.

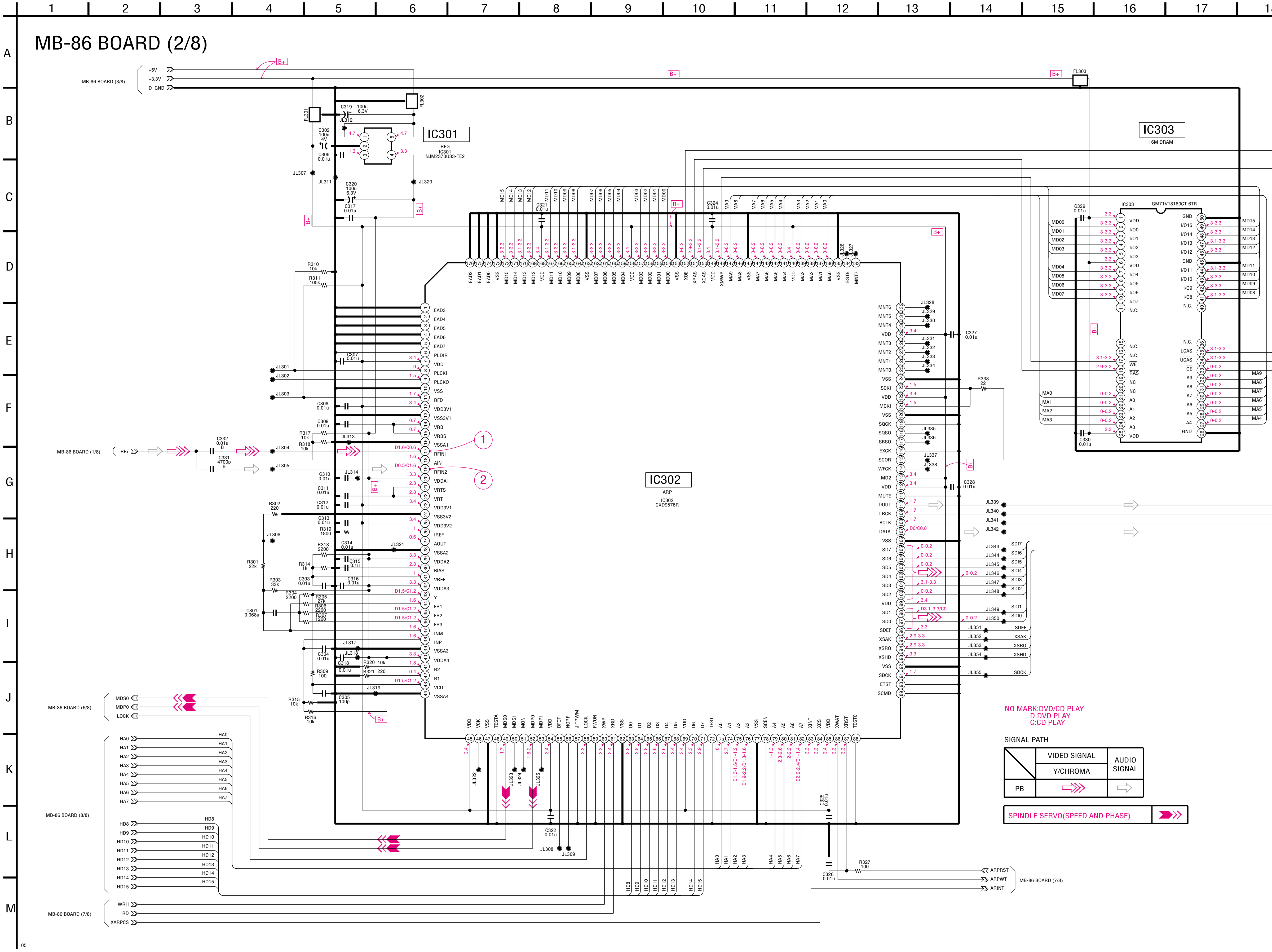
– Ref. No.: MB-86 board; 1,000 series –



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

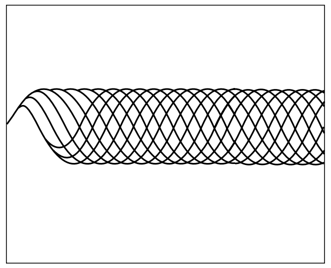
MB-86 (ARP) SCHEMATIC DIAGRAM • See page 4-7 for printed wiring board.

– Ref. No.: MB-86 board; 1,000 series –



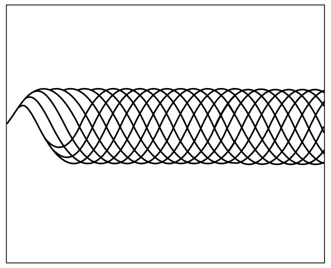
• **Waveforms**

❶ IC302 ⑰ (DVD play)
500 mV/DIV 100 ns/DIV



1.6 Vp-p

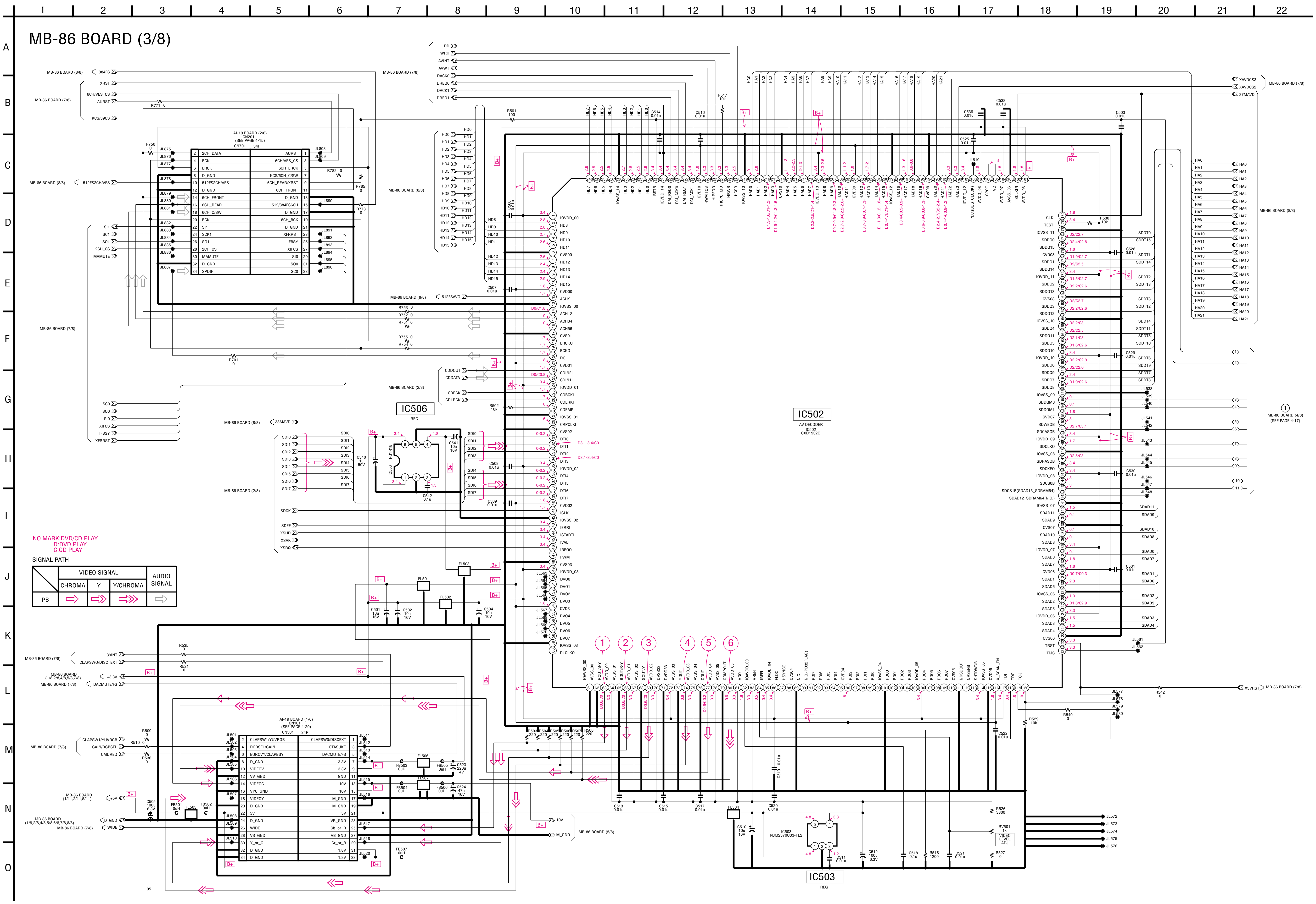
❷ IC302 ⑲ (CD play)
500 mV/DIV 200 ns/DIV



1.6 Vp-p

MB-86 (AV DECODER) SCHEMATIC DIAGRAM • See page 4-7 for printed wiring board.

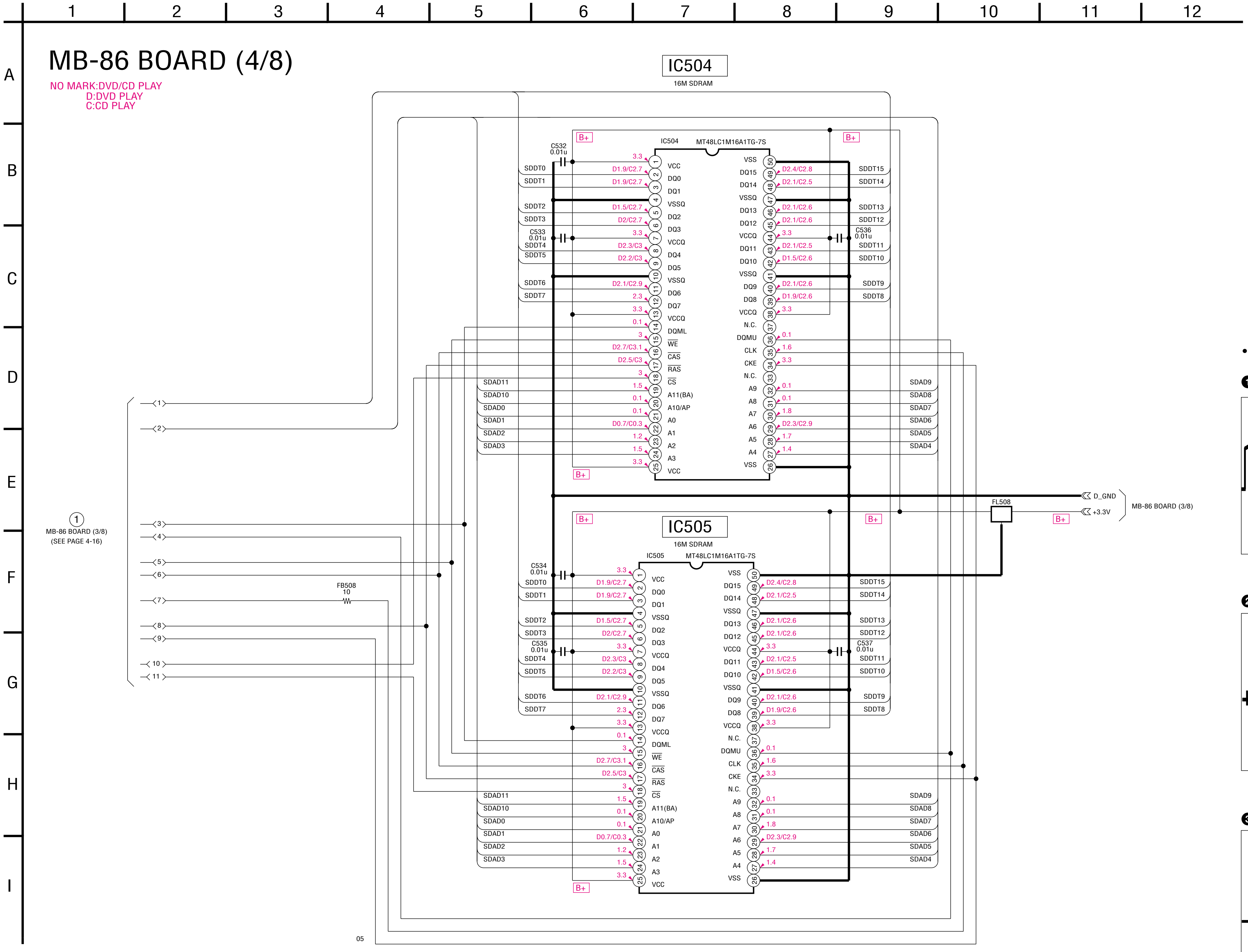
– Ref. No.: MB-86 board; 1,000 series –



AV DECODER
MB-86 (3/8)

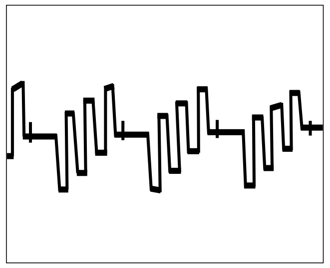
MB-86 (SDRAM) SCHEMATIC DIAGRAM • **See page 4-7 for printed wiring board.**

– Ref. No.: MB-86 board; 1,000 series –



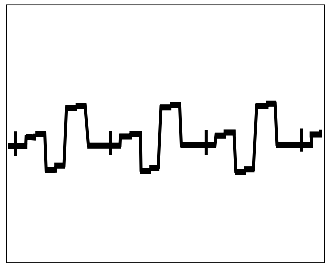
• Waveforms

❶ IC502 ⑬



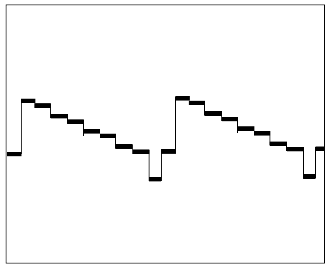
720 mVp-p (H)

❷ IC502 ⑯



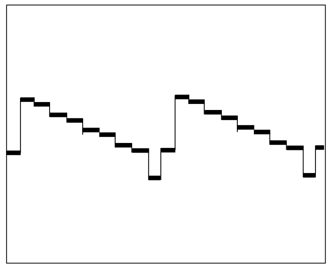
728 mVp-p (H)

❸ IC502 ⑲



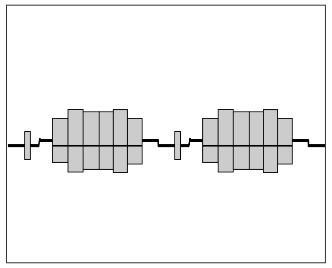
1.0 Vp-p (H)

❹ IC502 ⑭



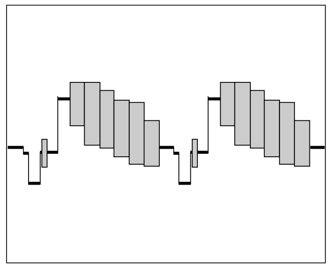
1.1 Vp-p (H)

❺ IC502 ⑰



520 mVp-p (H)

❻ IC502 ⑳

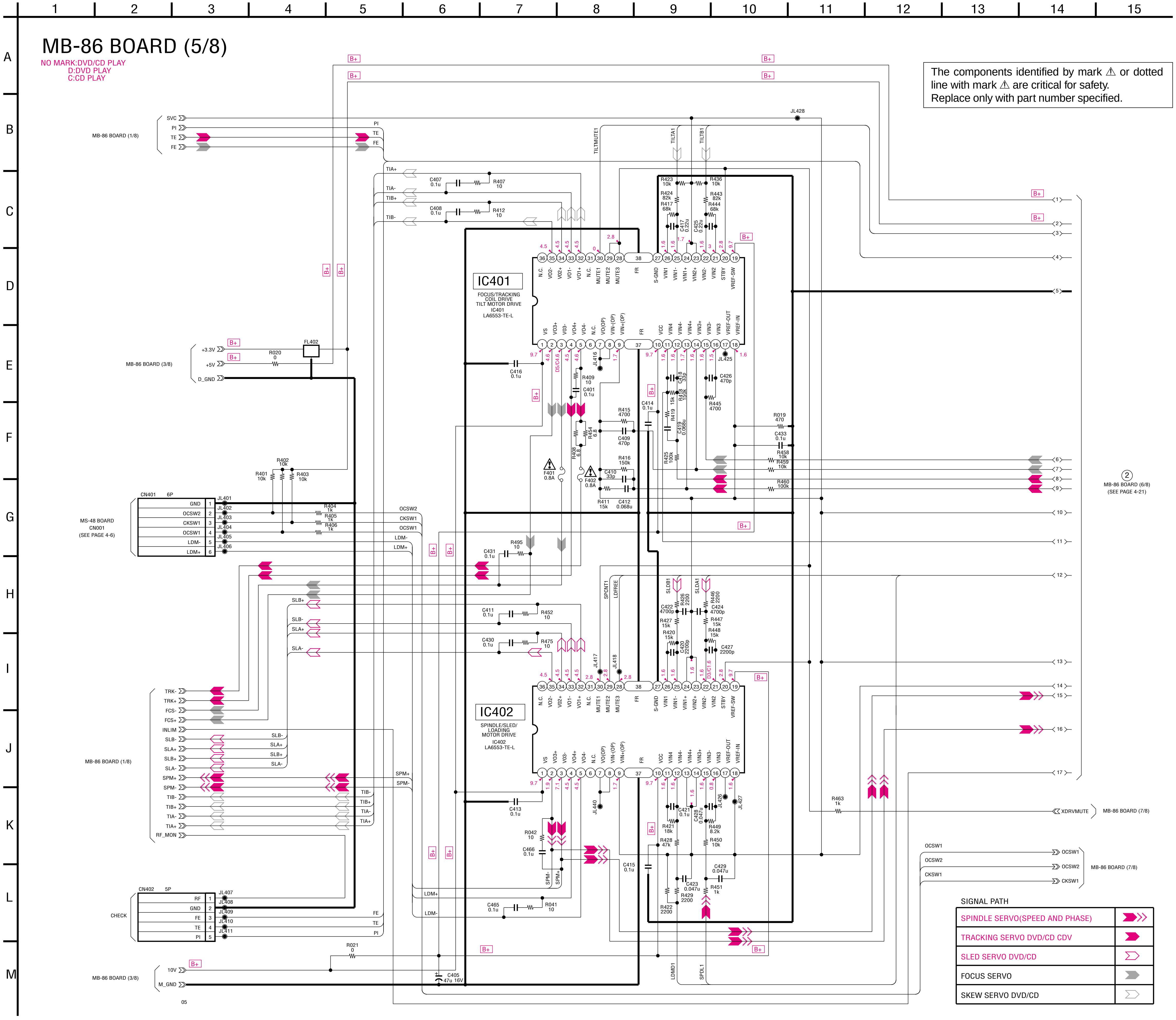


1.2 Vp-p (H)

SDRAM
MB-86 (4/8)

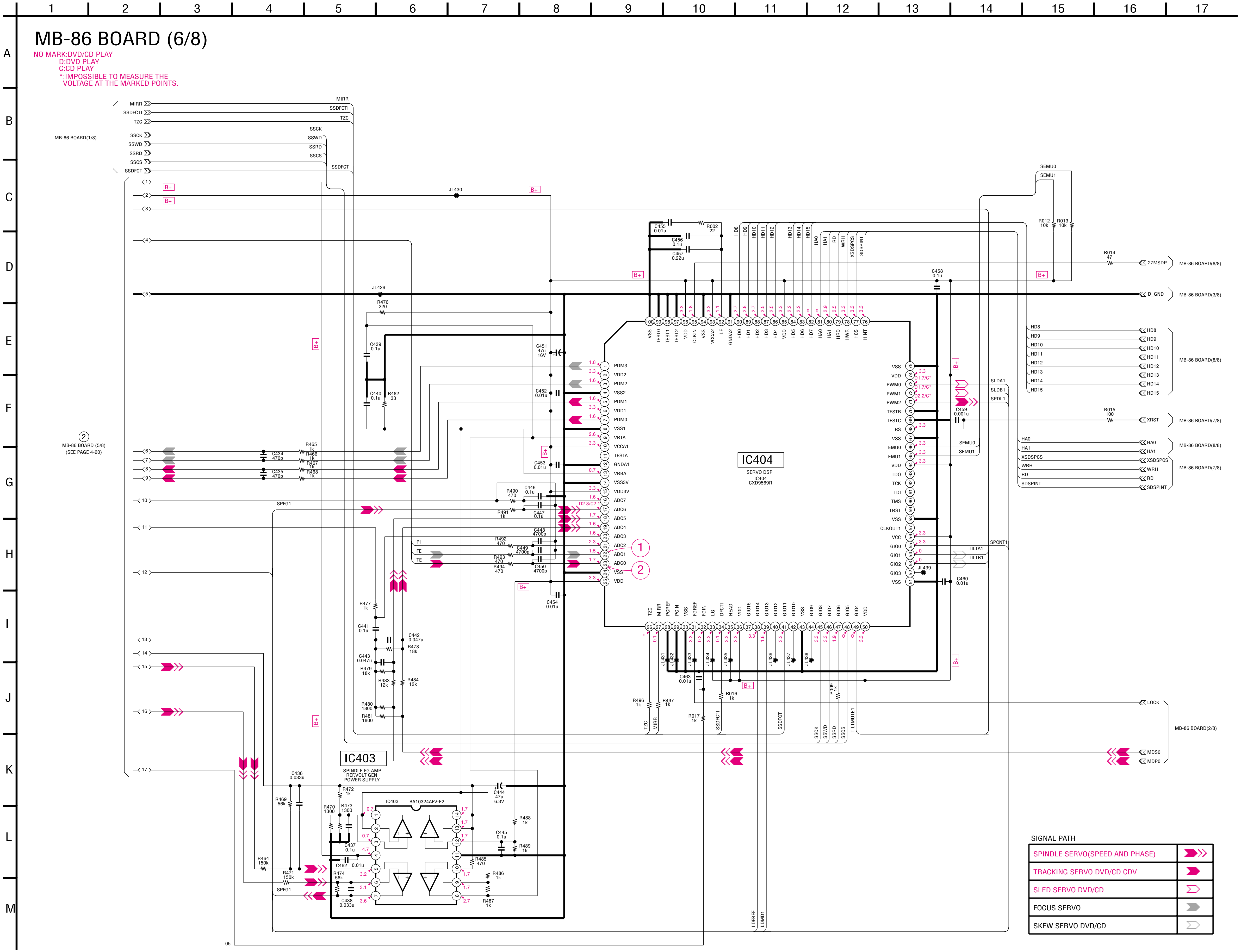
MB-86 (DRIVE) SCHEMATIC DIAGRAM • **See page 4-7 for printed wiring board.**

– Ref. No.: MB-86 board; 1,000 series –



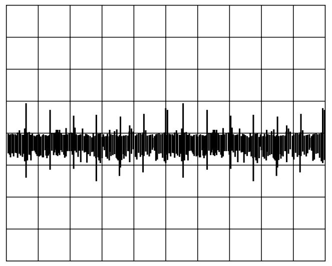
MB-86 (SERVO DSP) SCHEMATIC DIAGRAM • See page 4-7 for printed wiring board.

– Ref. No.: MB-86 board; 1,000 series –



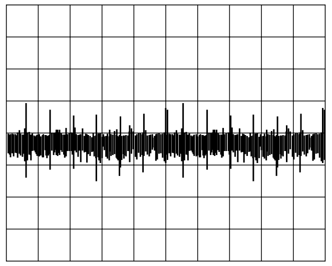
• Waveforms

❶ IC404 ㉒ (DVD play)
100 mV/DIV 50 ms/DIV



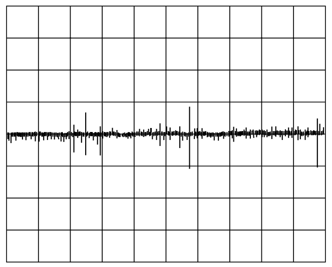
180 mVp-p

❶ IC404 ㉒ (CD play)
500 mV/DIV 50 ms/DIV



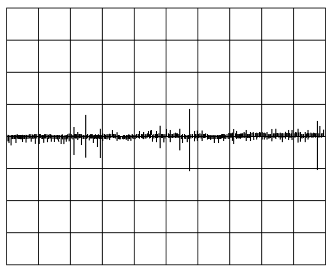
860 mVp-p

❷ IC404 ㉓ (DVD play)
500 mV/DIV 50 ms/DIV



1.4 Vp-p

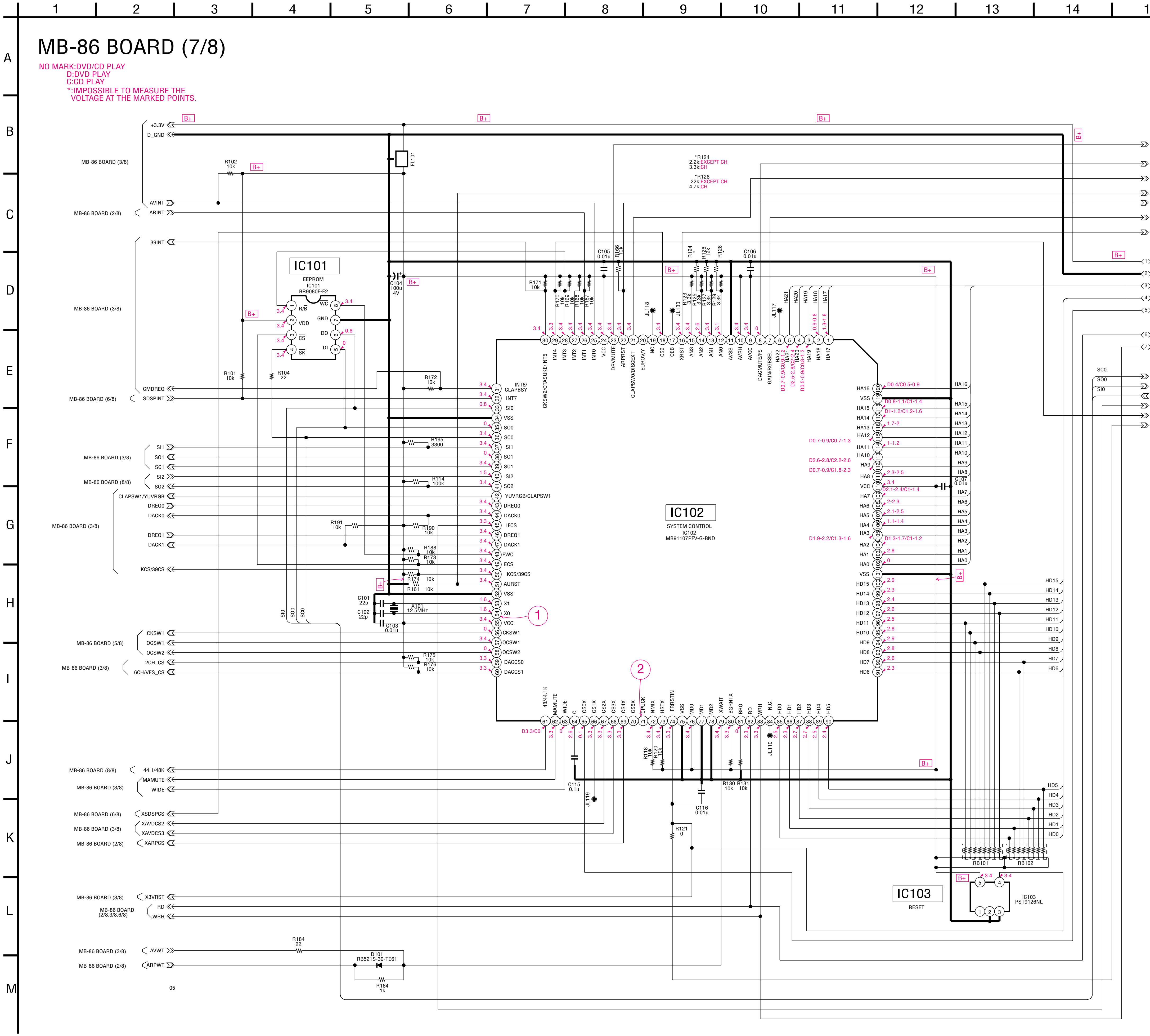
❷ IC404 ㉓ (CD play)
500 mV/DIV 200 mV/DIV



1.7 Vp-p

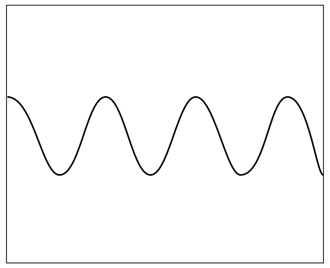
MB-86 (SYSTEM CONTROL) SCHEMATIC DIAGRAM • See page 4-7 for printed wiring board.

– Ref. No.: MB-86 board; 1,000 series –



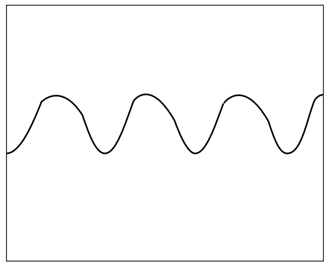
• Waveforms

❶ IC102 ㊹



2.4 Vp-p (12.5 MHz)

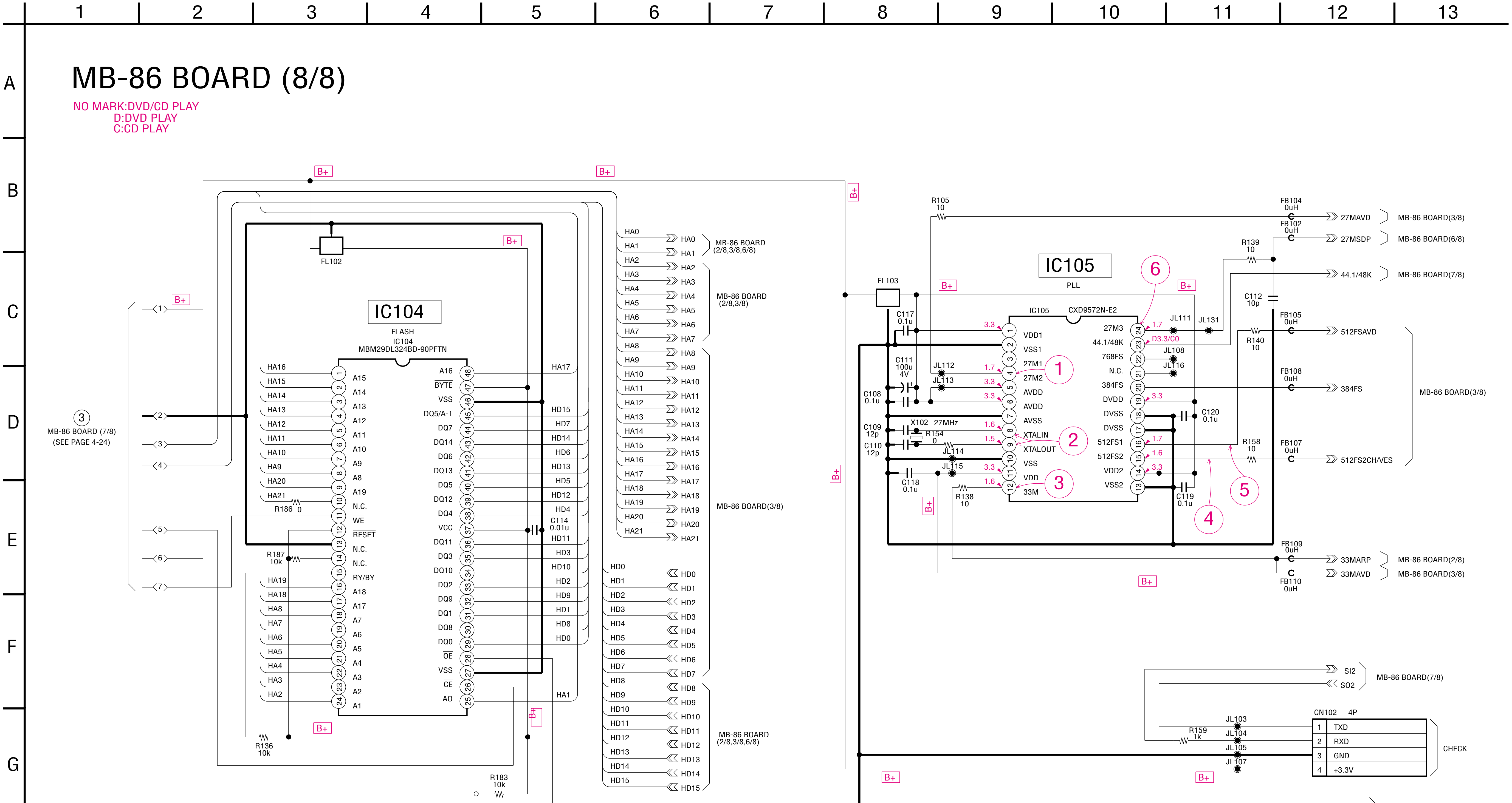
❷ IC102 ㉑



4 Vp-p (25.3 MHz)

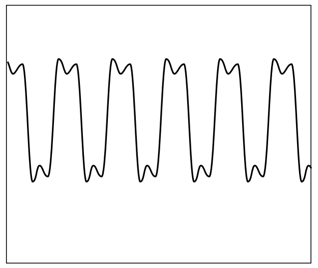
MB-86 (MEMORY, CLOCK GENERATOR) SCHEMATIC DIAGRAM • See page 4-7 for printed wiring board.

– Ref. No.: MB-86 board; 1,000 series –



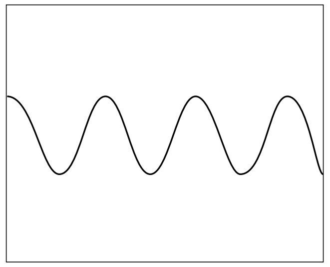
• Waveforms

❶ IC105 ④



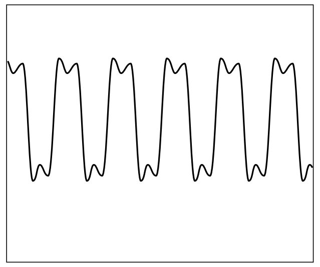
5.2 Vp-p (27 MHz)

❷ IC105 ⑧, ⑨



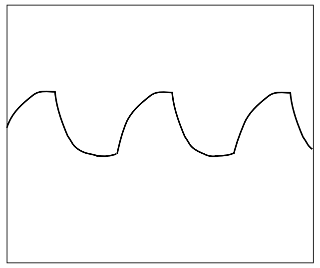
2.5 Vp-p (27 MHz)

❸ IC105 ⑫



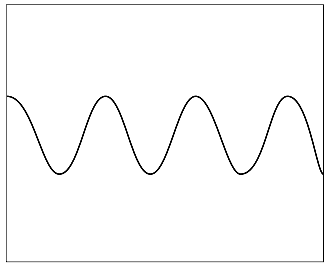
4.9 Vp-p (33.8688 MHz)

❹ IC105 ⑮



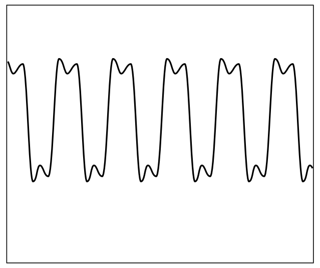
DVD : 3.4 Vp-p (29.5 MHz)
CD : 3.4 Vp-p (22.58 MHz)

❺ IC105 ⑯



DVD : 4.3 Vp-p (29.5 MHz)
CD : 4.3 Vp-p (22.58 MHz)

❻ IC105 ㉔

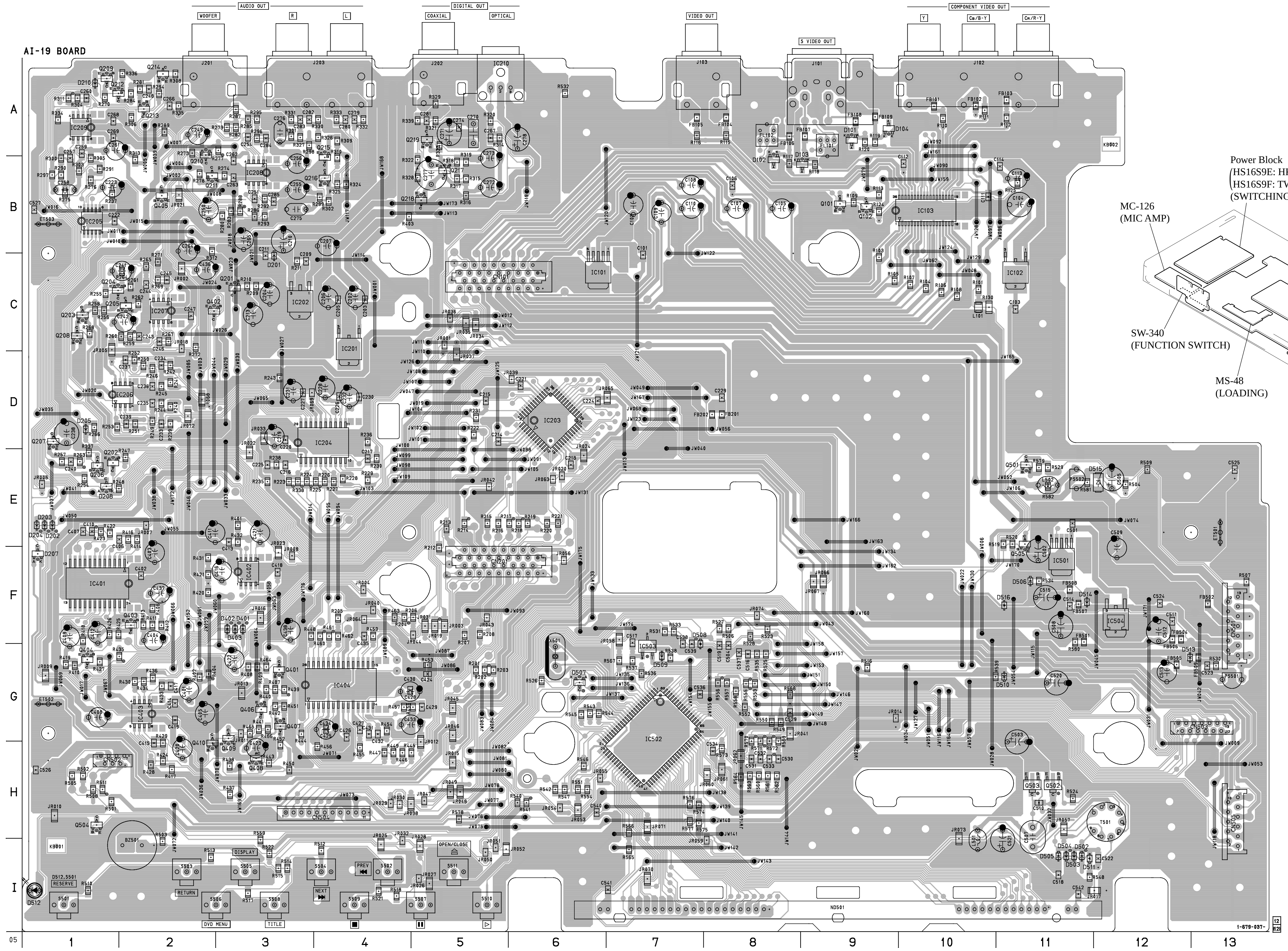


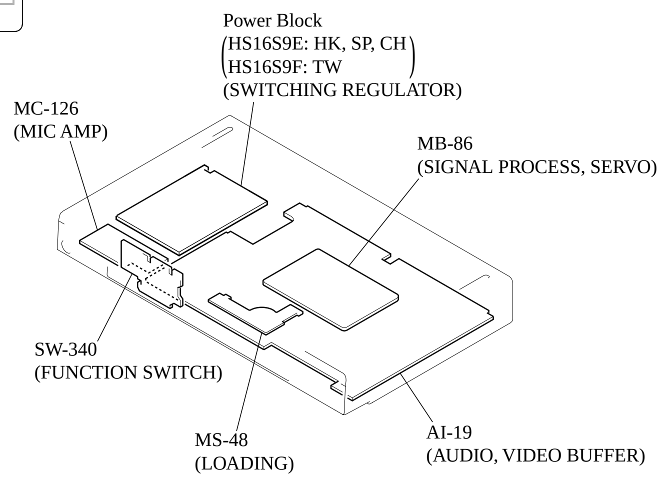
4.9 Vp-p (27.2 MHz)

AI-19 (AUDIO, VIDEO BUFFER) PRINTED WIRING BOARD

– Ref. No.: AI-19 board; 2,000 series –

There are a few cases that the part isn't mounted in this model is printed on this diagram.



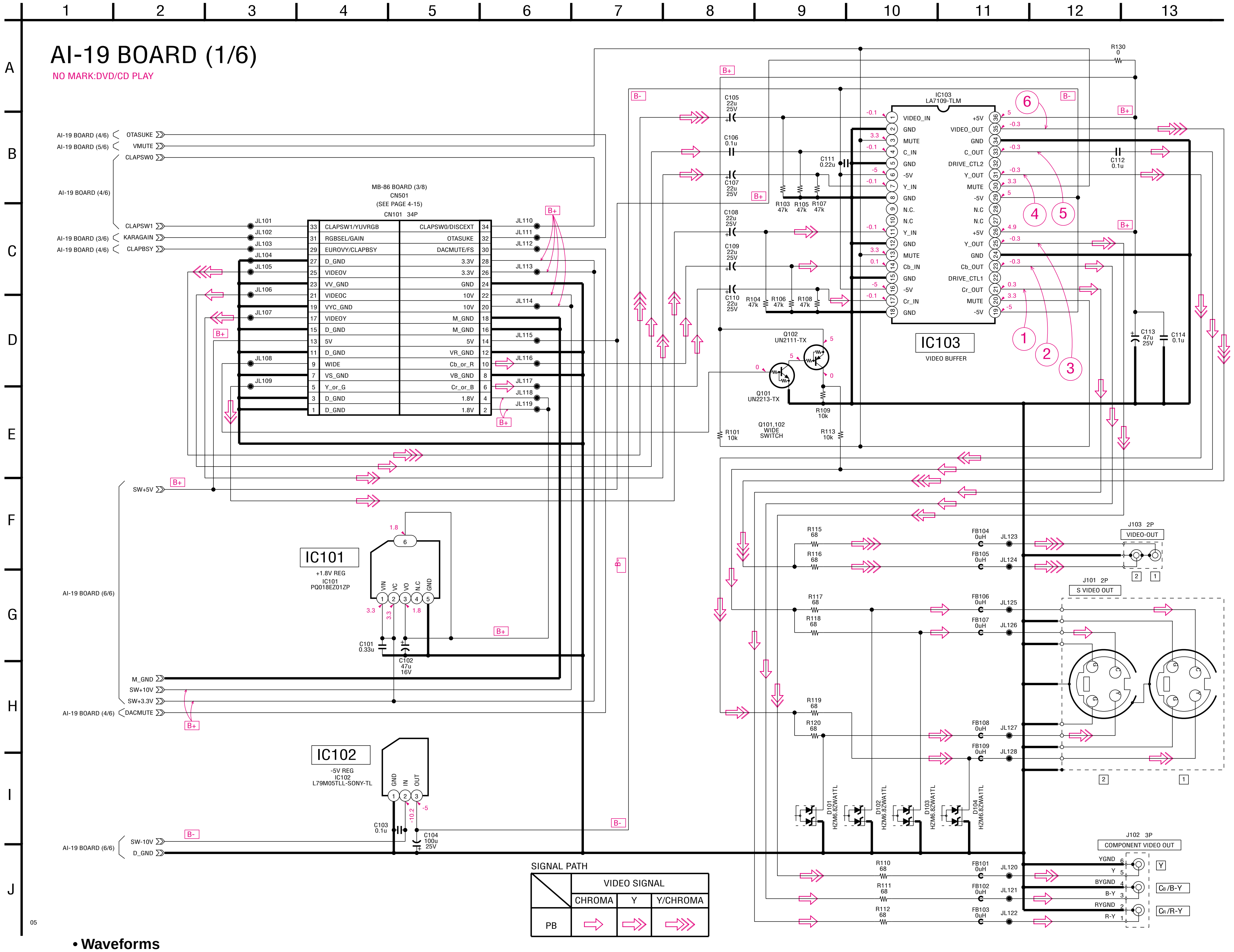


AI-19 BOARD

CN101	C-5
CN201	F-5
CN501	F-13
CN502	H-1
CN503	G-12
CN504	H-4
CN505	H-12
D101	A-9
D102	B-8
D103	B-9
D104	A-9
D201	C-3
D202	E-1
D203	E-1
D204	E-1
D205	D-1
D207	F-1
D208	E-1
D401	F-3
D402	F-3
D403	F-3
D502	I-11
D503	I-11
D504	I-11
D505	I-11
D507	G-6
D509	G-7
D511	I-11
D512	I-1
D513	G-12
D514	F-11
D516	F-11
IC101	C-6
IC102	C-11
IC103	B-10
IC201	C-4
IC202	C-3
IC203	D-6
IC204	D-4
IC205	B-1
IC206	D-2
IC207	C-2
IC208	B-3
IC209	A-1
IC210	A-5
IC401	F-1
IC402	F-3
IC403	G-2
IC404	G-4
IC501	F-11
IC502	G-7
IC503	G-7
IC504	F-12
Q101	B-9
Q102	B-9
Q201	C-3
Q202	E-1
Q203	C-1
Q204	C-1
Q205	C-1
Q206	E-1
Q207	D-1
Q208	C-1
Q209	A-1
Q210	A-2
Q211	B-2
Q212	A-1
Q213	A-2
Q214	A-2
Q215	B-4
Q216	B-4
Q218	B-5
Q401	G-3
Q402	C-2
Q403	F-2
Q404	G-1
Q405	B-2
Q406	G-3
Q407	G-3
Q408	H-3
Q409	G-3
Q410	H-2
Q501	E-11
Q502	H-11
Q503	H-11
Q504	H-1
Q505	F-11

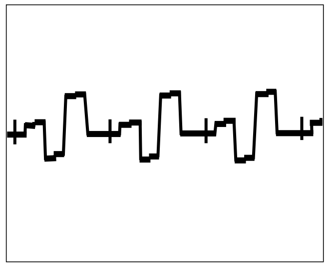
AI-19 (VIDEO BUFFER) SCHEMATIC DIAGRAM

– Ref. No.: AI-19 board; 2,000 series –



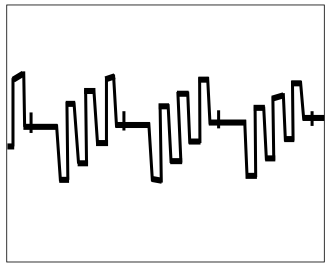
• Waveforms

❶ IC103 ㉑



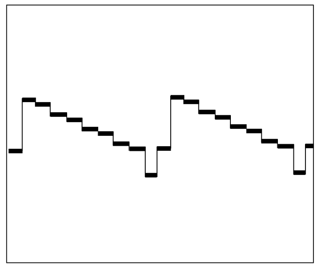
728 mVp-p (H)

❷ IC103 ㉓



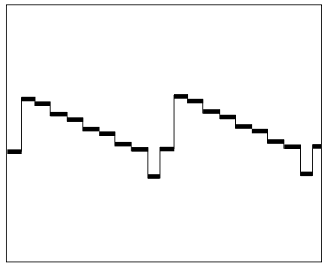
720 mVp-p (H)

❸ IC103 ㉕



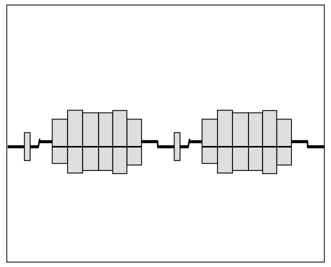
1.0 Vp-p (H)

❹ IC103 ㉛



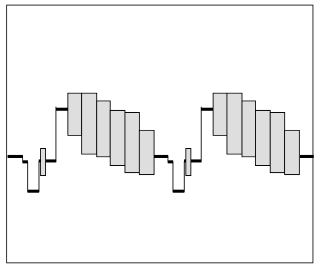
2.1 Vp-p (H)

❺ IC103 ㉝



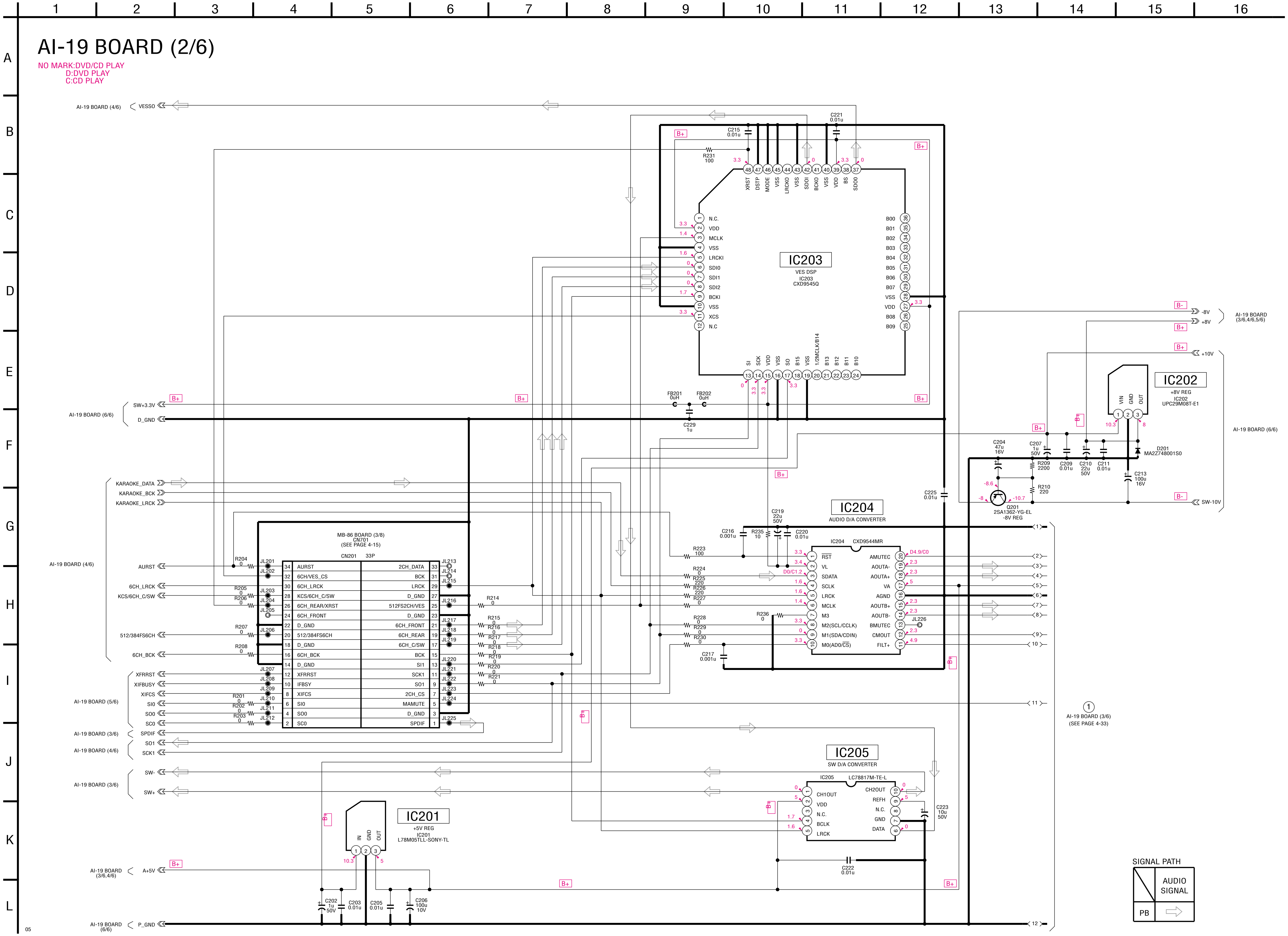
520 mVp-p (H)

❻ IC103 ㉟



2.4 Vp-p (H)

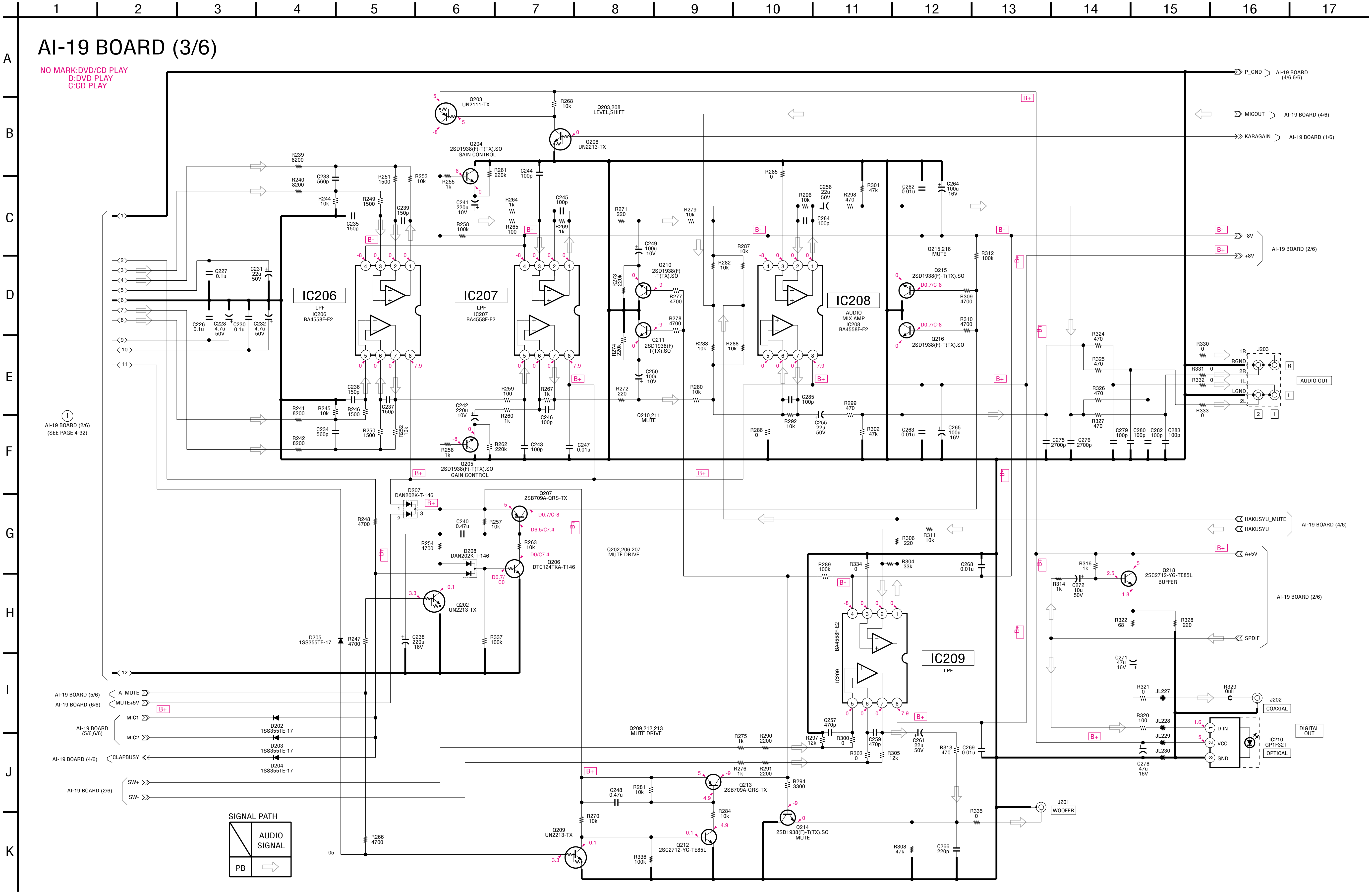
AI-19 (D/A CONVERTER, DSP) SCHEMATIC DIAGRAM • See page 4-27 for printed wiring board.
– Ref. No.: AI-19 board; 2,000 series –



D/A CONVERTER, DSP
AI-19 (2/6)

AI-19 (AMP, LPF) SCHEMATIC DIAGRAM • See page 4-27 for printed wiring board.

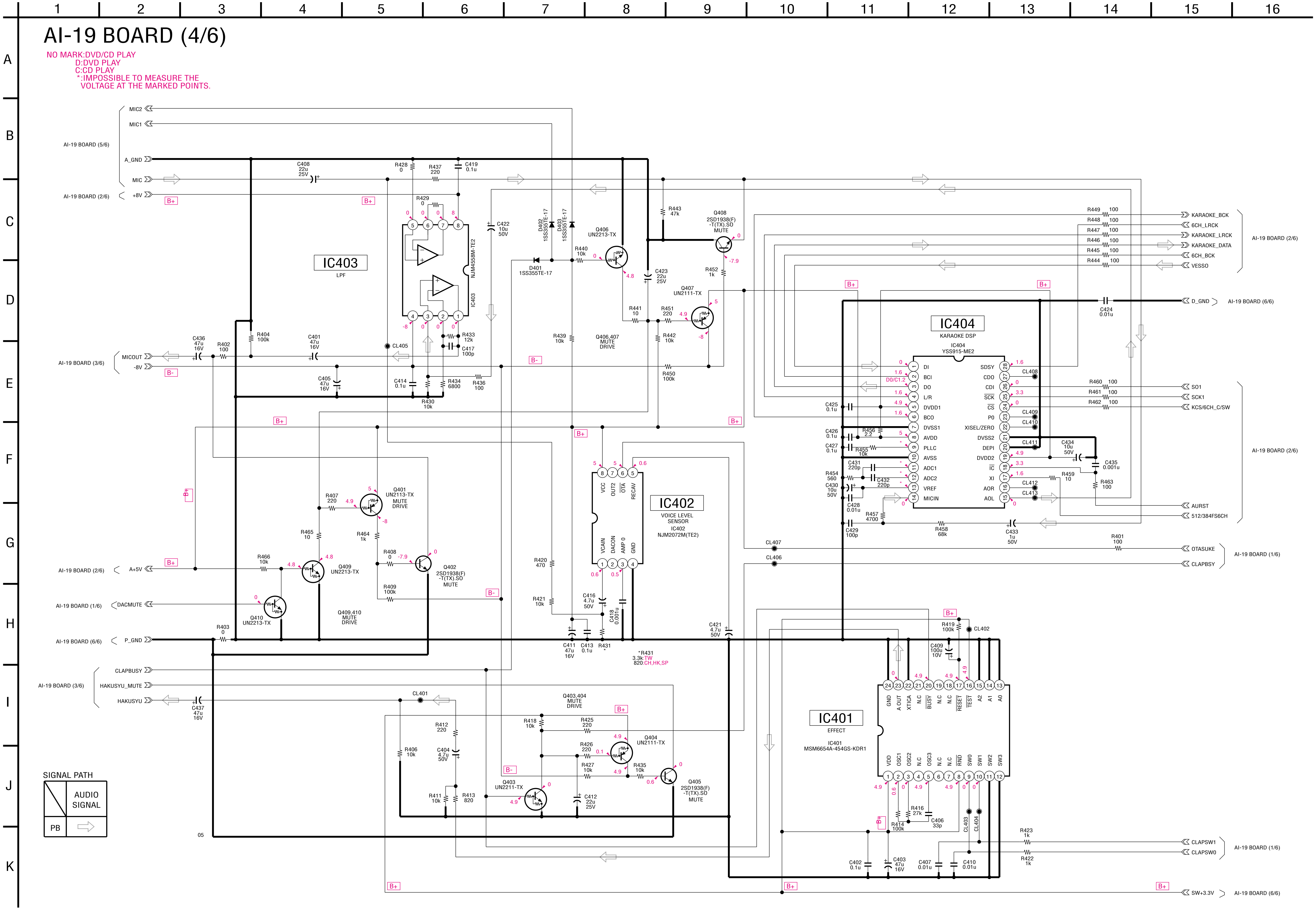
– Ref. No.: AI-19 board; 2,000 series –



AMP, LPF
AI-19 (3/6)

AI-19 (KARAOKE DSP) SCHEMATIC DIAGRAM • **See page 4-27 for printed wiring board.**

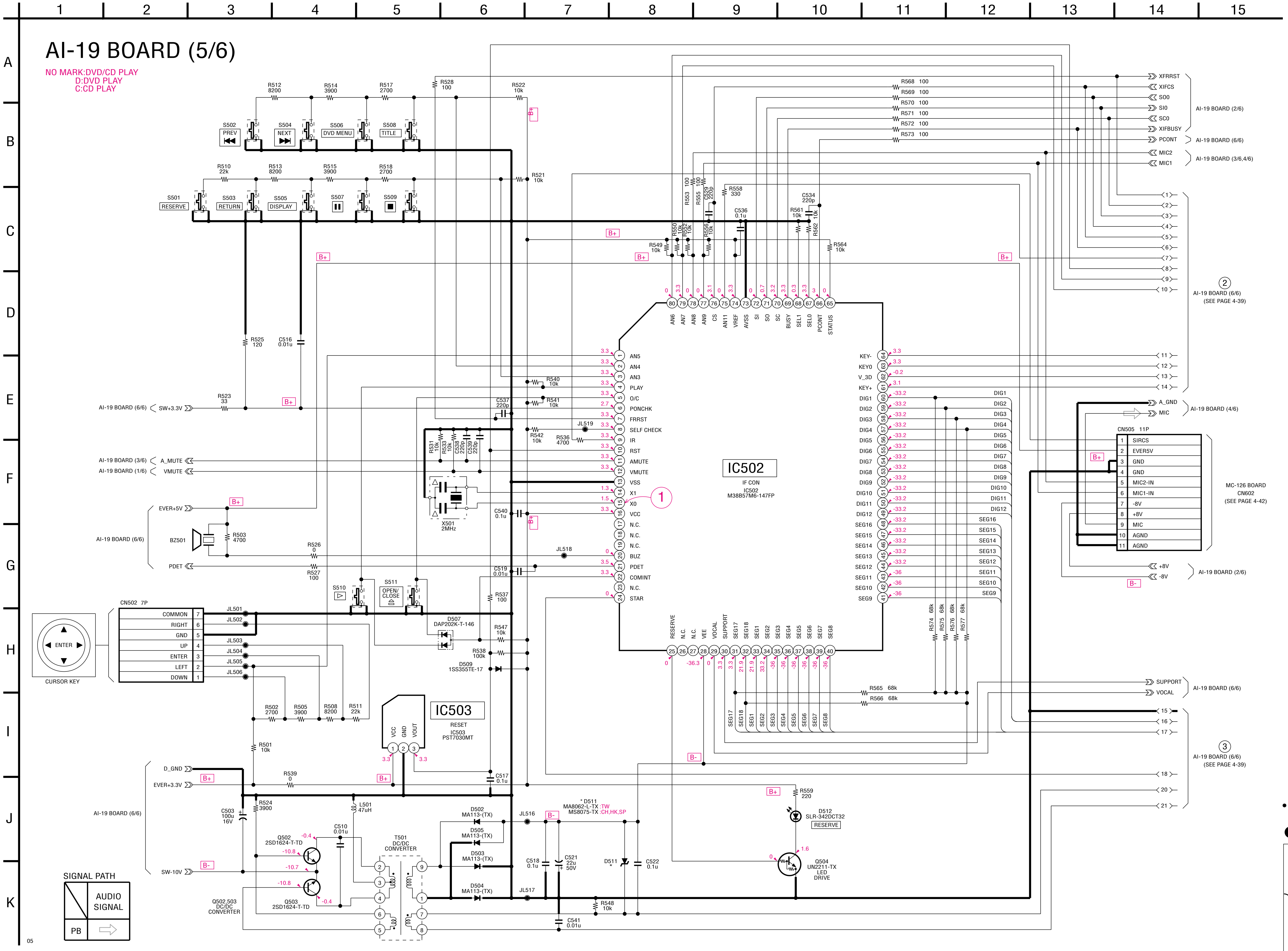
– Ref. No.: AI-19 board; 2,000 series –



KARAOKE DSP
AI-19 (4/6)

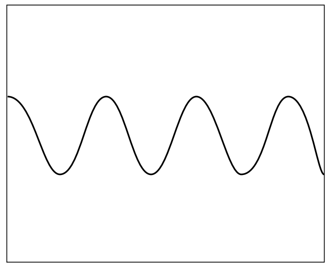
AI-19 (IF CON) SCHEMATIC DIAGRAM • See page 4-27 for printed wiring board.

– Ref. No.: AI-19 board; 2,000 series –



• **Waveform**

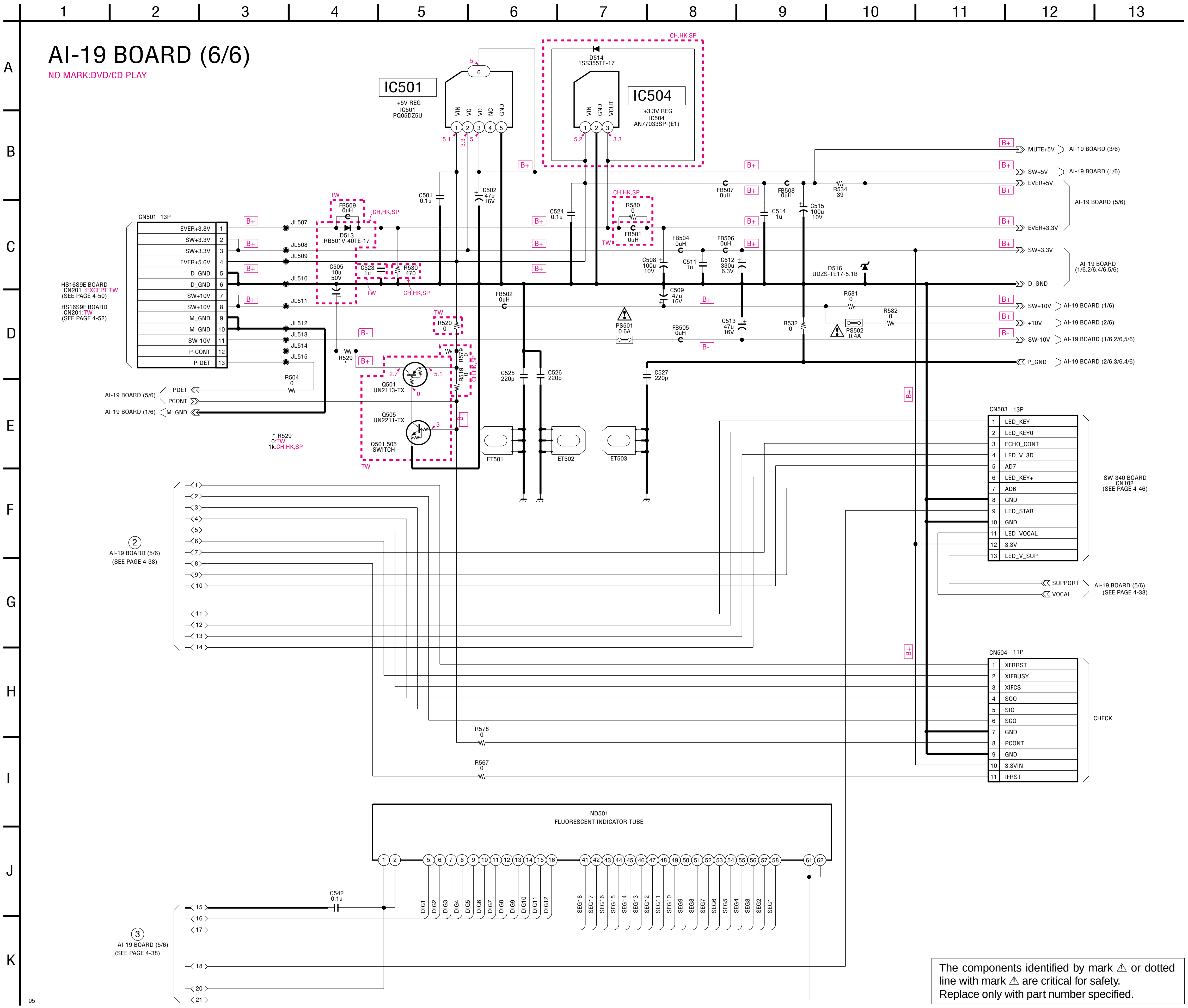
1 IC502 15



3.2 Vp-p (2 MHz)

AI-19 (POWER SUPPLY, DISPLAY) SCHEMATIC DIAGRAM • See page 4-27 for printed wiring board.

– Ref. No.: AI-19 board; 2,000 series –

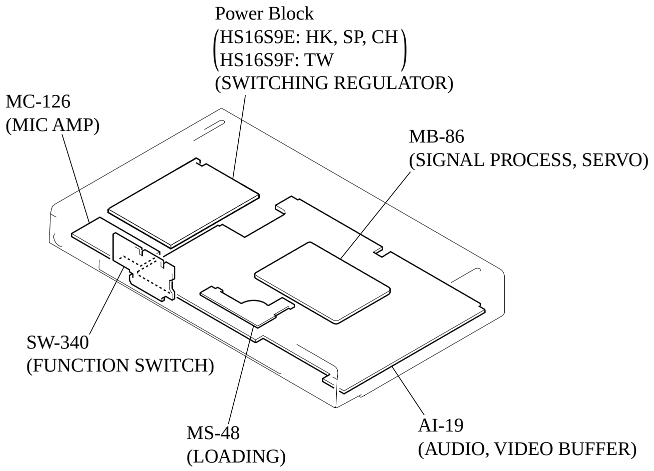


The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

There are a few cases that the part isn't mounted in this model is printed on this diagram.

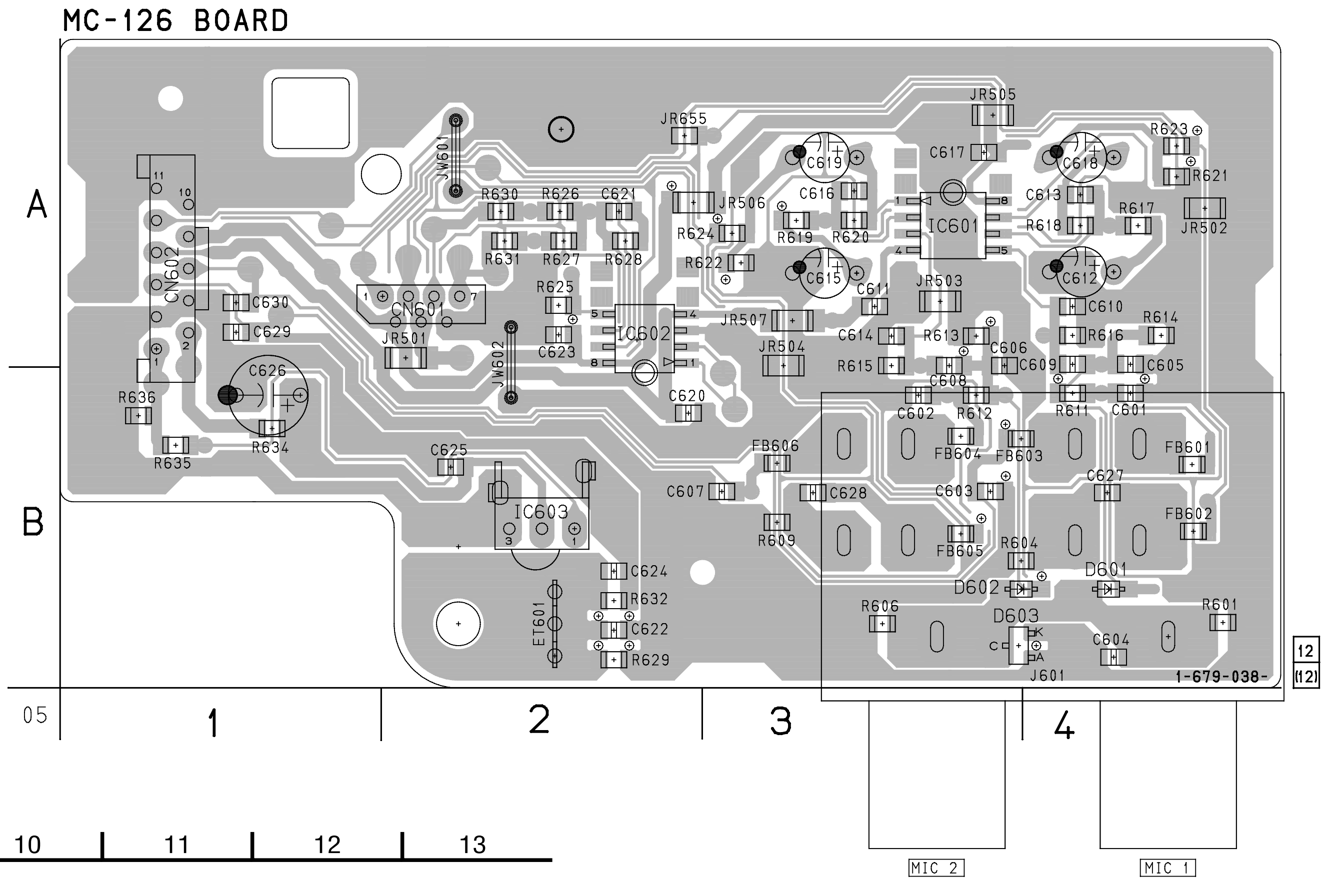
MC-126 (MIC AMP) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

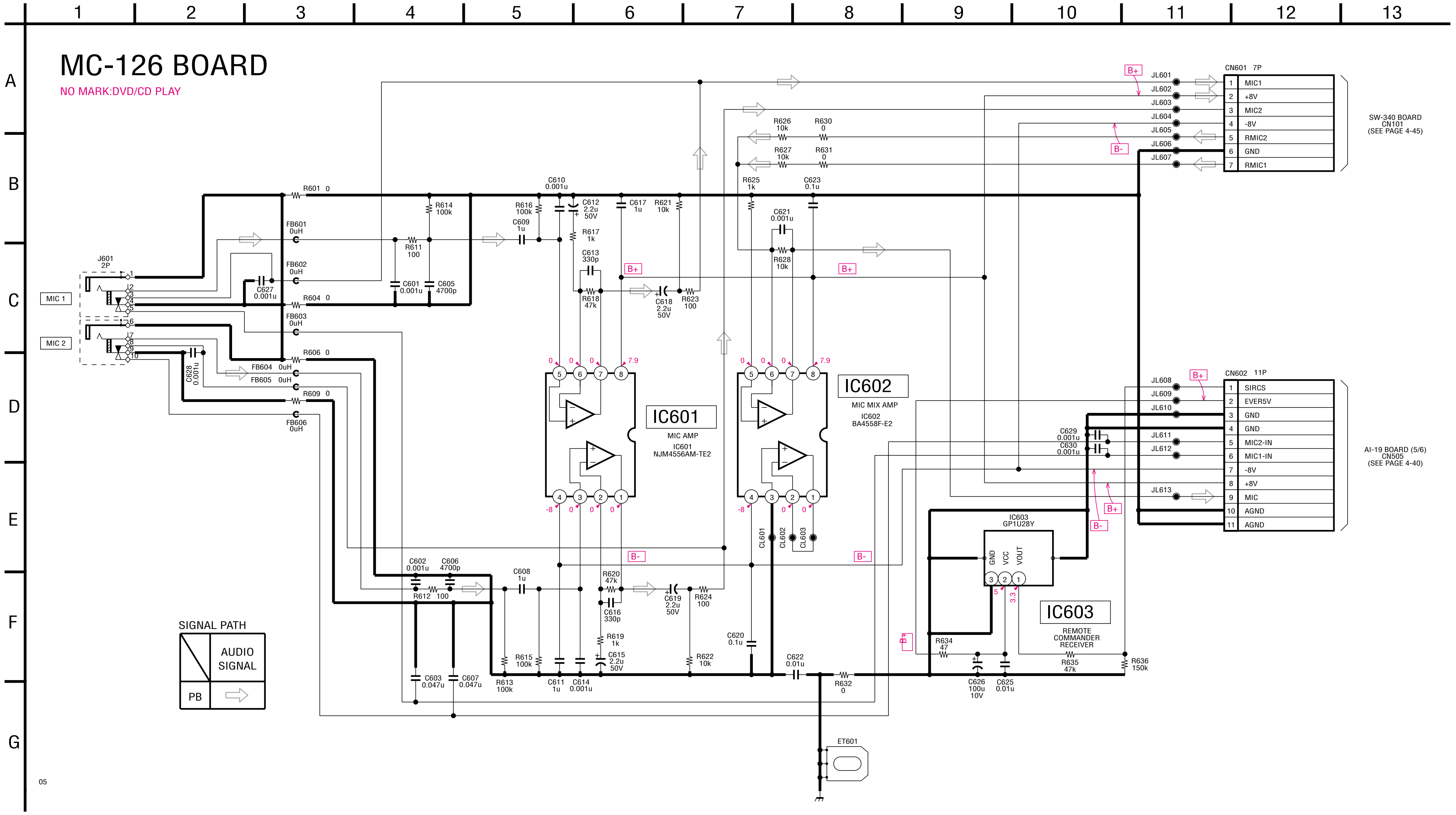
– Ref. No.: MC-126 board 2,000 series –



MC-126 BOARD

CN601	A-2
CN602	A-1
IC601	A-3
IC602	A-2
IC603	B-2



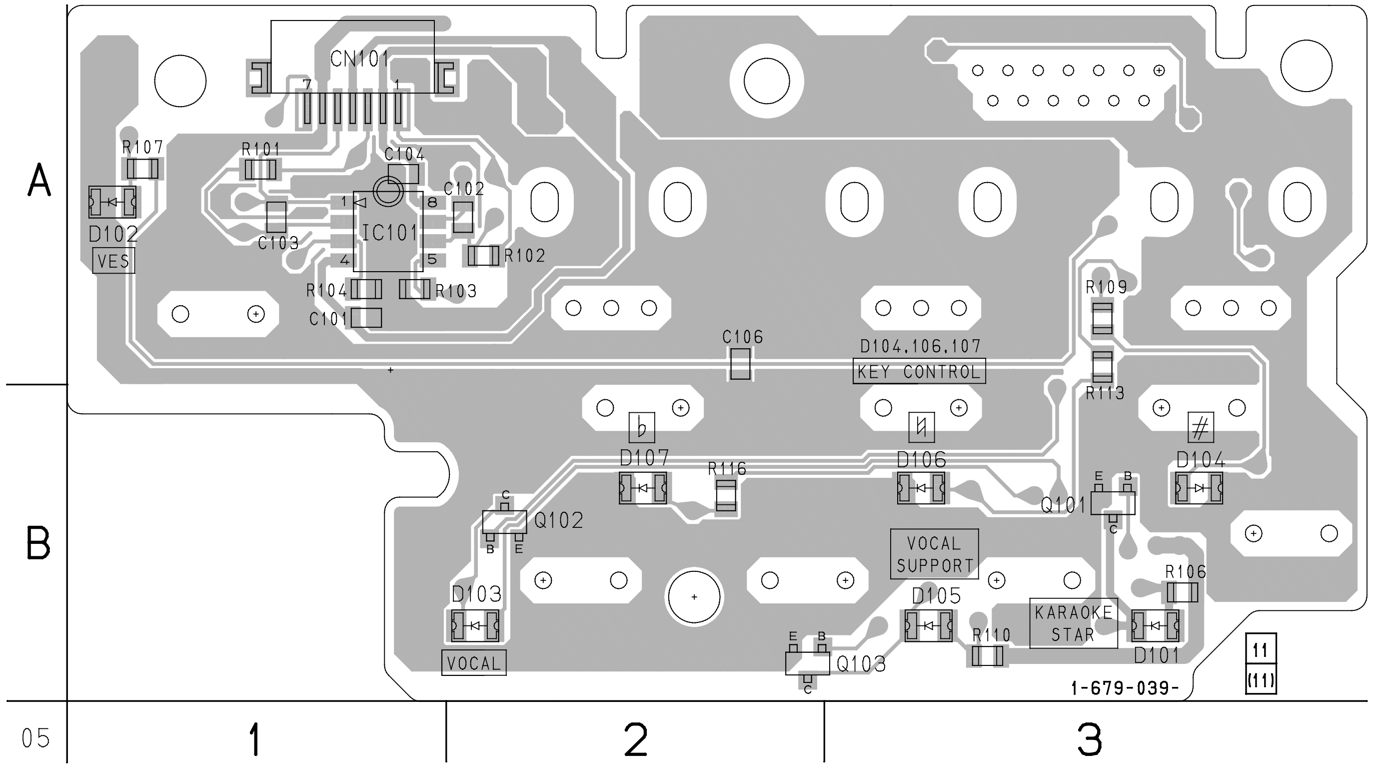


MIC AMP
MC-126

SW-340 (FUNCTION SWITCH) PRINTED WIRING BOARD
– Ref. No.: SW-340 board; 3,000 series –

There are a few cases that the part isn't mounted in this model is printed on this diagram.

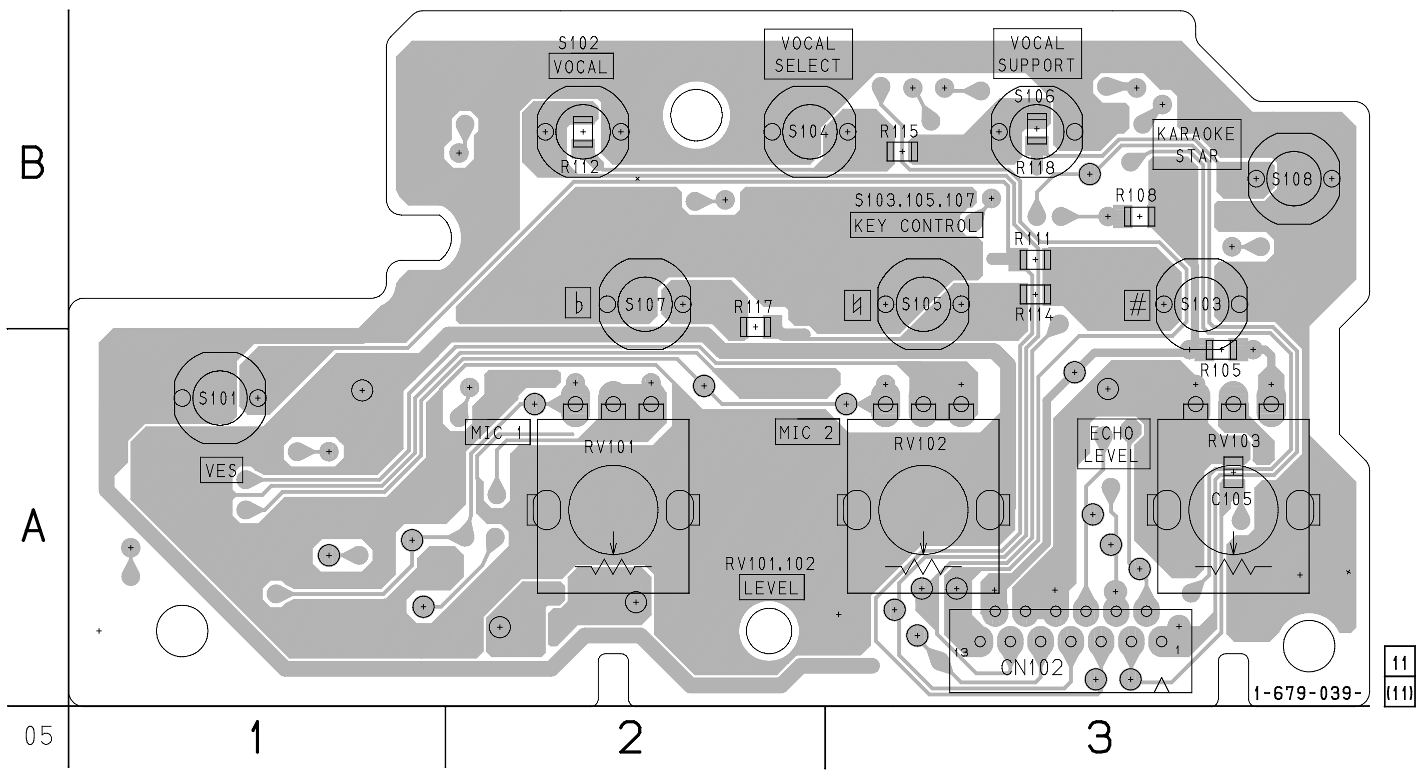
SW-340 BOARD(SIDE A)



SW-340 BOARD (SIDE A)

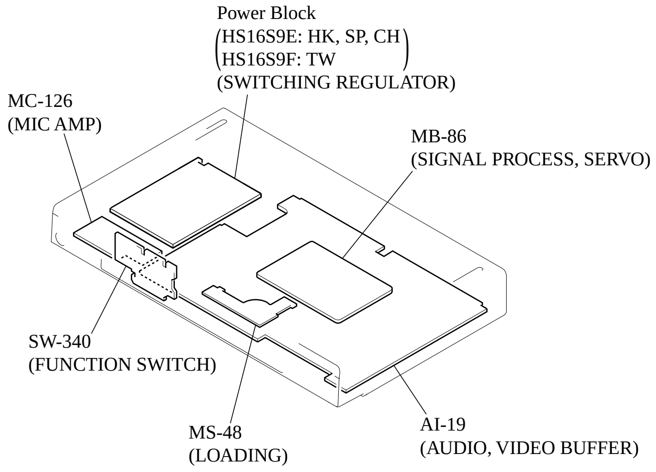
CN101	A-1
D101	B-3
D102	A-1
D103	B-2
D104	B-3
D105	B-3
D106	B-3
D107	B-2
IC101	A-1
Q101	B-3
Q102	B-2
Q103	B-2

SW-340 BOARD(SIDE B)



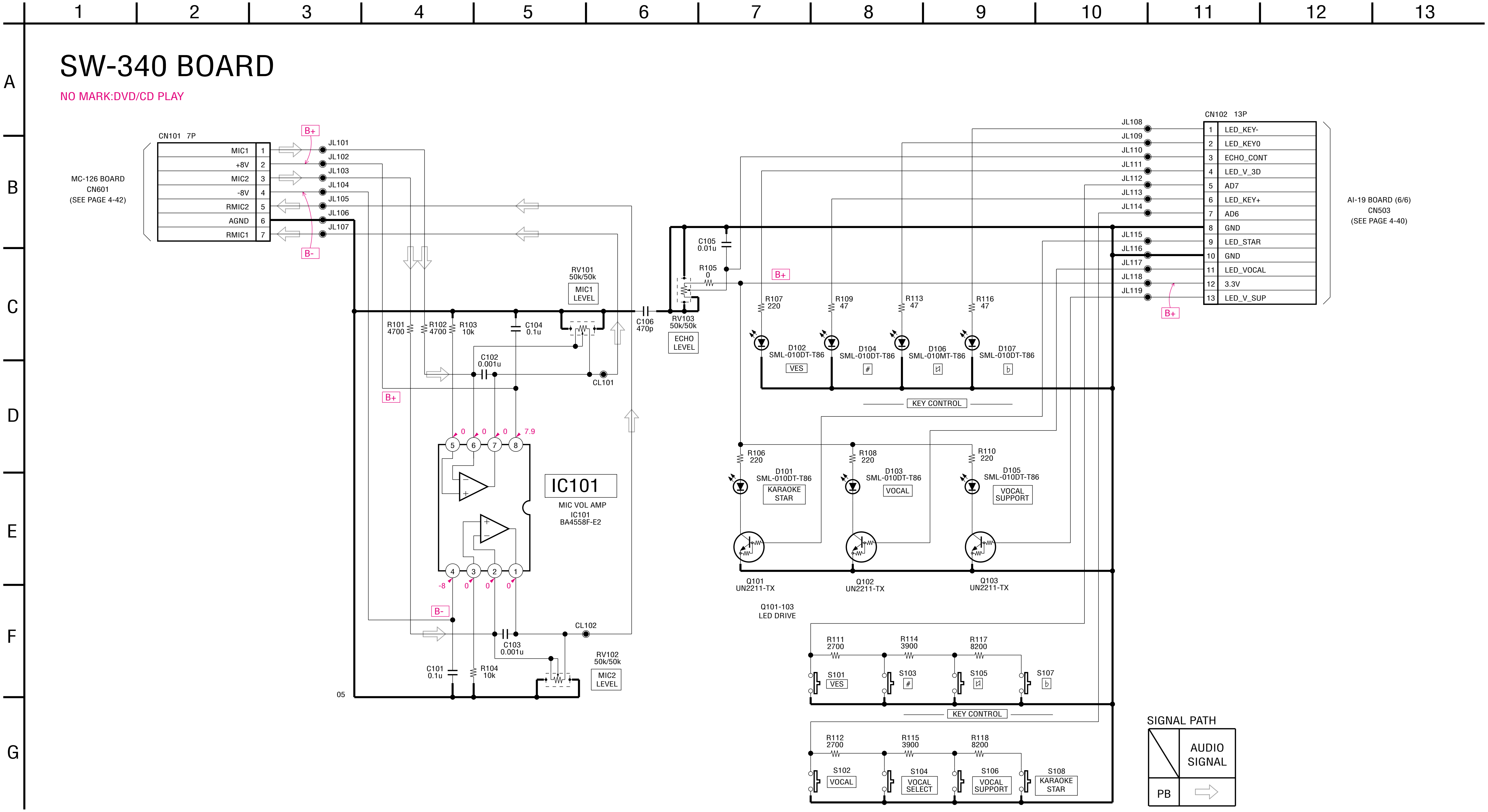
SW-340 BOARD (SIDE B)

CN-102	A-3



SW-340 (FUNCTION SWITCH) SCHEMATIC DIAGRAM

– Ref. No.: SW-340 board; 3,000 series –



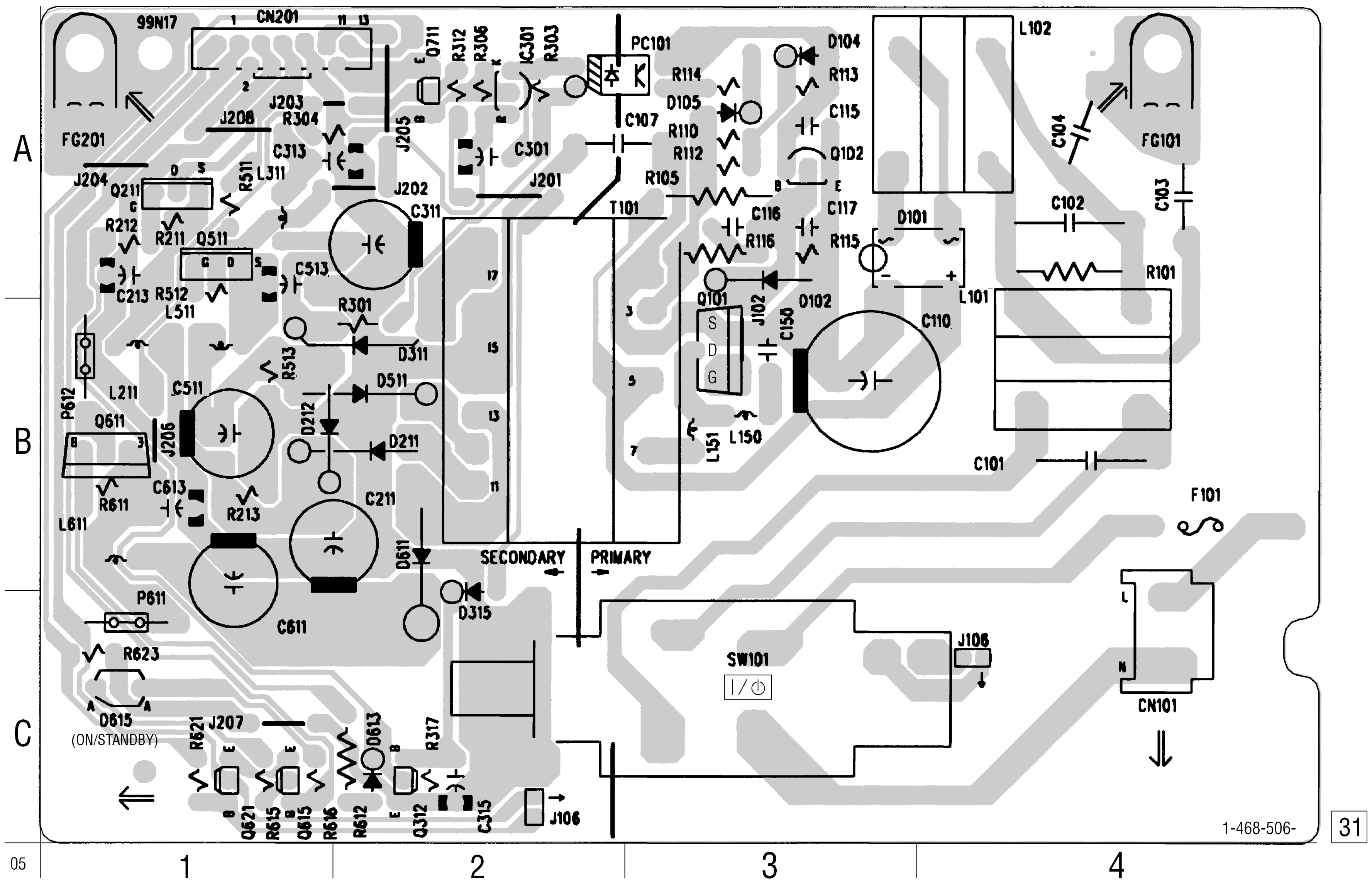
HS16S9E (SWITCHING REGULATOR) PRINTED WIRING BOARD
– Ref. No.: HS16S9E board; 4,000 series –
– EXCEPT Taiwan model –

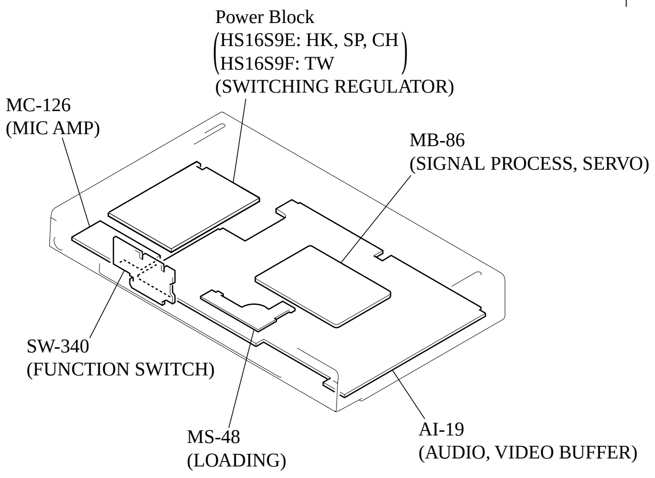
There are a few cases that the part isn't mounted in this model is printed on this diagram.

HS16S9E BOARD

CN101	C-4
CN201	A-1
D101	A-3
D102	A-3
D104	A-3
D105	A-3
D211	B-2
D212	B-1
D311	B-2
D315	C-2
D511	B-2
D611	B-2
D613	C-2
D615	C-1
IC301	A-2
Q101	B-3
Q102	A-3
Q211	A-1
Q312	C-2
Q511	A-1
Q611	B-1
Q615	C-1
Q621	C-1
Q711	A-2

HS16S9E BOARD

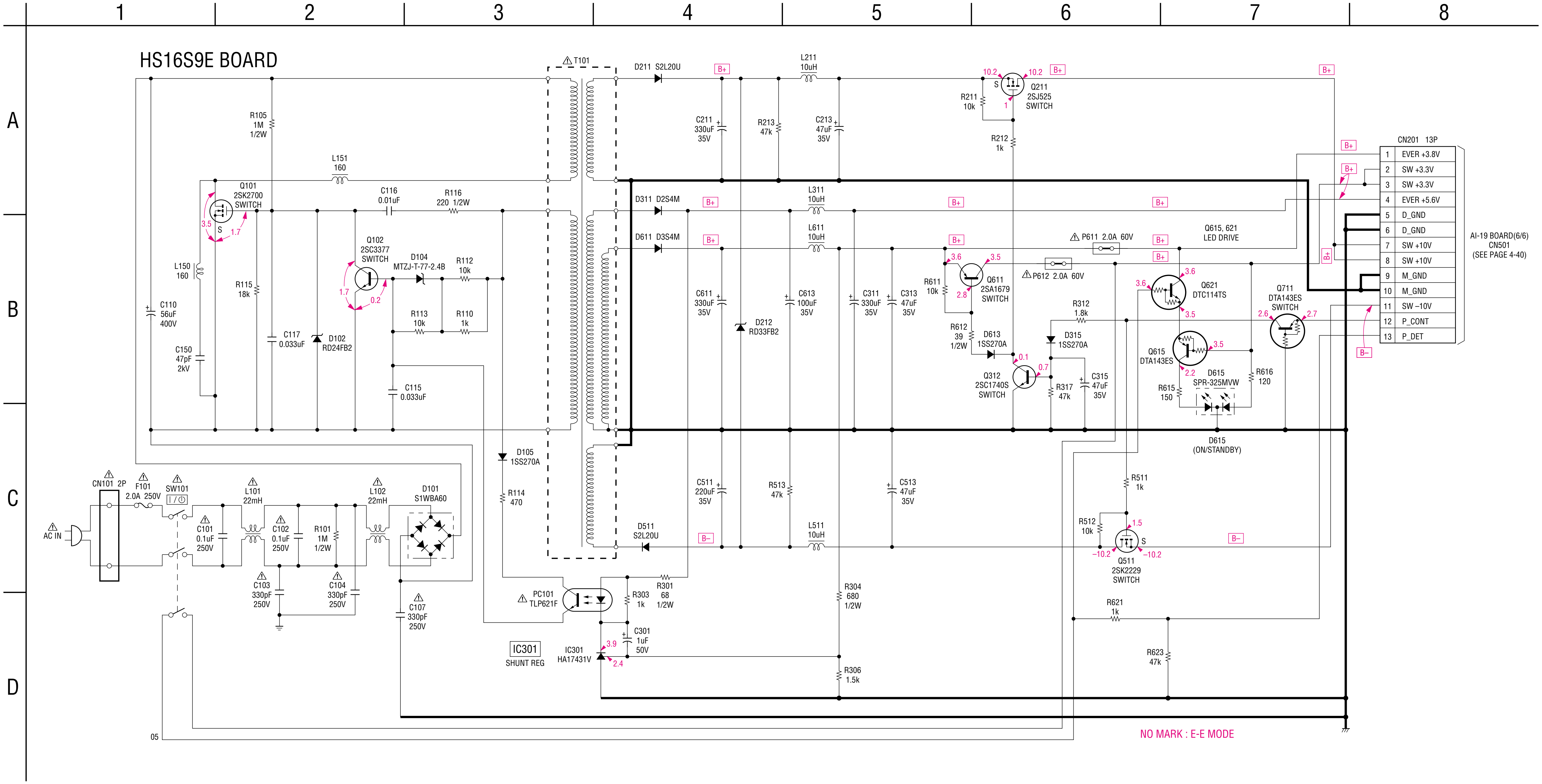




HS16S9E (SWITCHING REGULATOR) SCHEMATIC DIAGRAM

– Ref. No.: HS16S9E board; 4,000 series –

– EXCEPT Taiwan model –



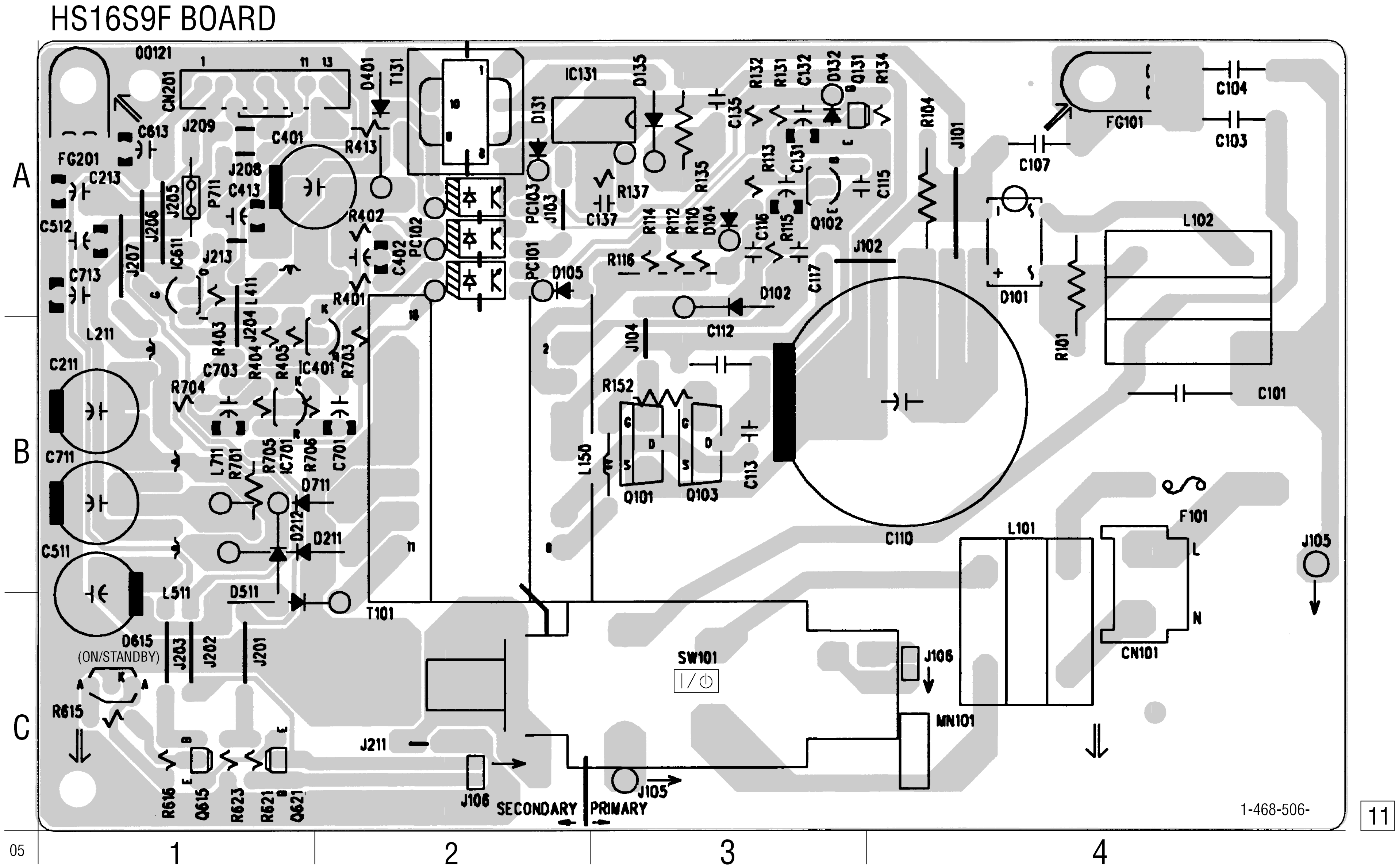
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

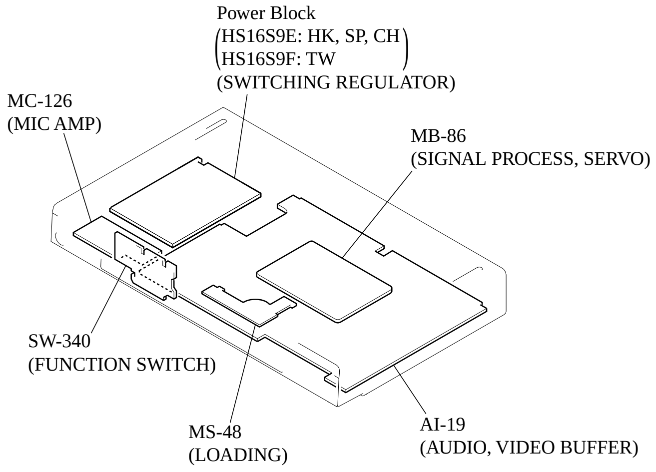
HS16S9F (SWITCHING REGULATOR) PRINTED WIRING BOARD
– Ref. No.: HS16S9F board; 5,000 series –
– Taiwan model –

There are a few cases that the part isn't mounted in this model is printed on this diagram.

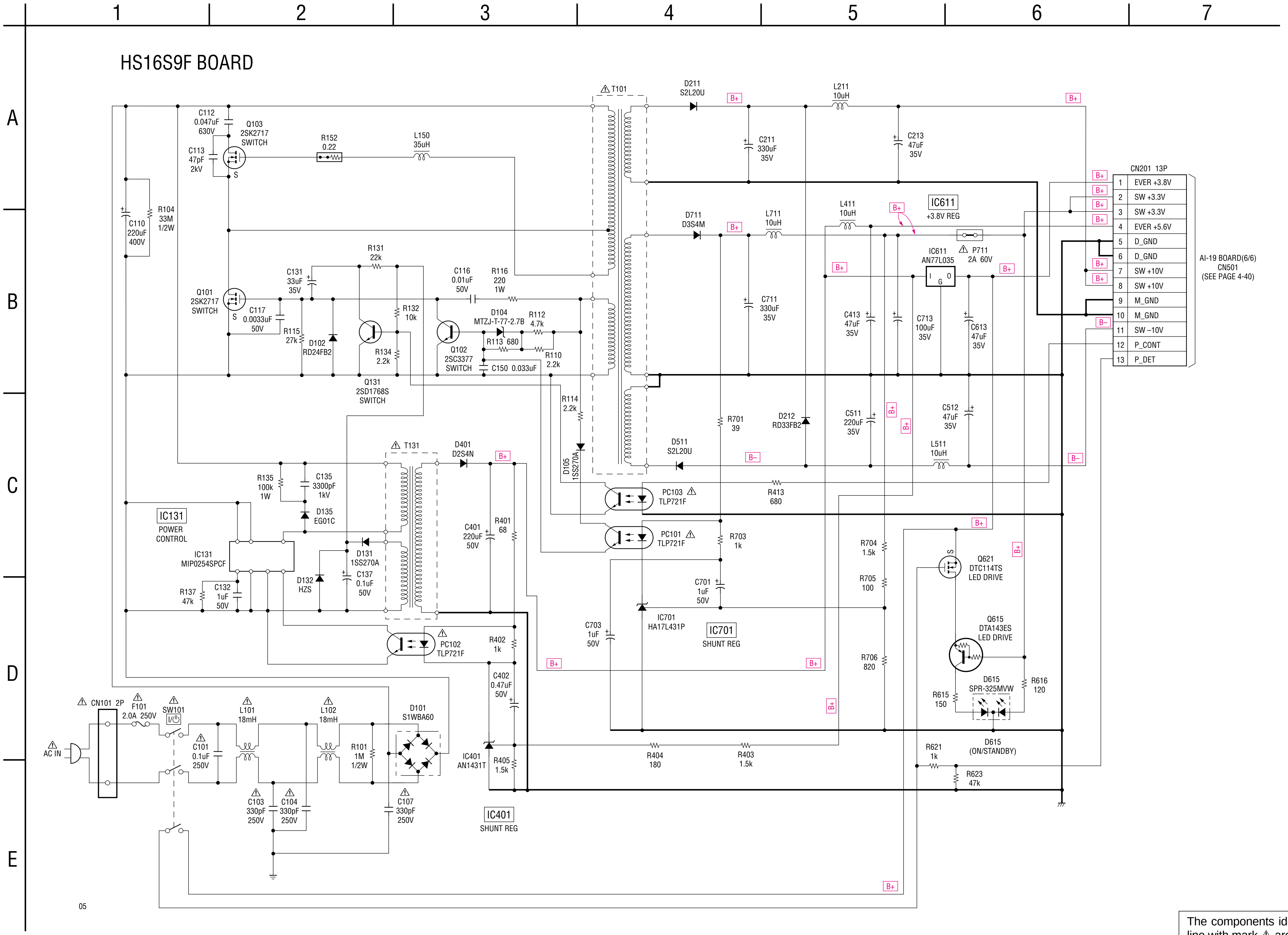
HS16S9F BOARD

CN101	C-4
CN201	A-1
D101	A-4
D102	A-3
D104	A-3
D105	A-2
D131	A-2
D132	A-3
D135	A-3
D211	B-1
D212	B-1
D401	A-2
D511	C-1
D615	C-1
D711	B-1
IC131	A-2
IC401	B-1
IC611	A-1
IC701	B-1
Q101	B-3
Q102	A-3
Q103	B-3
Q131	A-3
Q615	C-1
Q621	C-1





HS16S9F (SWITCHING REGULATOR) SCHEMATIC DIAGRAM
– Ref. No.: HS16S9F board; 5,000 series –
– Taiwan model –



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SECTION 5
IC PIN FUNCTION DESCRIPTION

5-1. SYSTEM CONTROL PIN FUNCTION (MB-86 BOARD IC102)

Pin No.	Pin name	I/O	Function
1–5	HA17-HA21	O	Address bus A17-A21
6	HA22	–	Not used
7	GAIN/RGBSEL	O	Color difference signal/RGB signal select signal output
8	MICMUTE/FS	O	MIC mute signal output
9	AVCC	–	Power supply
10	AVRH	–	Reference power supply (+3.3 V)
11	AVSS	–	Ground
12	AN0	I	Set of mode 0
13	AN1	I	Set of mode 1
14	AN2	I	Set of mode 2
15	AN3	I	Set of mode 3
16	XRST	O	System reset signal output
17	OEB	–	Not used
18	CS6	O	Chip select signal for servo DSP
19	NC	–	Not used
20	EUROV/Y	O	EURO V/Y select signal output
21	CLAPSW0/DISCEXT	O	Effect signal 0 output
22	ARPRST	O	Reset signal output for ARP
23	DRVMUTE	O	Drive mute signal output
24	VCC	–	Power supply
25	INT0	I	Input of interrupt from AV DEC
26	INT1	I	Input of interrupt from ARP
27	INT2	I	Input of interrupt from FGA
28	INT3	I	Input of interrupt from EEPROM
29	INT4	I	Input of interrupt from IF CON
30	CKSW2/OTASUKE/INT5	I	Input of interrupt from OTASUKE IC
31	CLAPBSY/INT6	I	Input of interrupt from EFFECT IC
32	INT7	I	Input of interrupt from servo DSP
33	SI0	I	Serial data input from IF CON and EEPROM
34	VSS	–	Ground
35	SO0	O	Serial data output to IF CON and EEPROM
36	SC0	O	Serial clock output to IF CON and EEPROM
37	SI1	I	Serial bus 1 (for data input)
38	SO1	O	Serial bus 1 (for data output)

Pin No.	Pin name	I/O	Function
39	SC1	O	Serial clock output
40	SI2	I	Serial bus 2 (for data input)
41	SO2	O	Serial bus 2 (for data output)
42	YUVRGB/CLAPSW1	O	Effect signal 1 output
43	DREQ0	I	Input of DMA-REQ 0 from AV DEC
44	DACK0	O	Output of DMA-ACK 0 to AV DEC
45	IFCS	O	Chip select signal to IF CON
46	DREQ1	I	Input of DMA-REQ 1 from AV DEC
47	DACK1	O	Output of DMA-ACK 1 to AV DEC
48	EWC	O	Write control signal output to EEPROM
49	ECS	O	Chip select signal output to EEPROM
50	KCS/39CS	O	Chip select signal output to KARAOKE DSP
51	AURST	O	Reset signal output to audio DAC
52	VSS	–	Ground
53	X1	O	Clock output (12.5 MHz)
54	X0	I	Clock input (12.5 MHz)
55	VCC	–	Power supply
56	CKSW1	I	Chuck sensor input
57	OCSW1	I	Tray sensor input
58	OCSW2	I	Tray sensor input
59	DACCS0	O	Chip select signal output to DAC (2ch)
60	DACCS1	O	Chip select signal output to DAC (6ch) and DSP
61	48/44.1K	O	PLL FS control signal output
62	MAMUTE	O	Audio mute signal output
63	WIDE	O	WIDE select signal output
64	C	–	Capacitor (0.1uF) connect between ground
65	CS0X	O	External ROM chip select signal output
66	CS1X	–	Not used
67	CS2X	O	Chip select signal output (for AV DEC)
68	CS3X	O	Chip select signal output (for AV DEC)
69	CS4X	O	Chip select signal output (for ARP)
70	CS5X	O	Chip select signal output (for FGA)

Pin No.	Pin name	I/O	Function
71	CPUCK	O	CPU clock signal output
72	NMIX	–	Not used (fixed at “H”)
73	HSTX	–	Not used (fixed at “H”)
74	FRRSTIN	I	Reset signal input from IF CON
75	VSS	–	Ground
76	MD0	I	Input of mode select 0 (fixed at “1”)
77	MD1	–	Ground
78	MD2	–	Ground
79	XWAIT	I	Wait signal input
80	BGRNTX	–	Test terminal (fixed at “H”)
81	BRQ	–	Test terminal (fixed at “L”)
82	RD	O	Read enable signal output
83	WRH	O	High byte write enable signal output (16 bit and 8 bit)
84	NC	–	Not used
85–92	HD0-HD7	I/O	Data bus D0-D7 (16 bit only)
93–100	HD8-HD15	I/O	Data bus D8-D15 (16 bit) , D0-D7 (8 bit)
101	VSS	–	Ground
102–109	HA0-HA7	O	Address bus A00-A07
110	VCC	–	Power supply
111–118	HA8-HA15	O	Address bus A08-A15
119	VSS	–	Ground
120	HA16	O	Address bus A16

SECTION 6
TEST MODE

6-1. GENERAL DESCRIPTION

The Test Mode allows you to make diagnosis and adjustment easily using the remote commander and monitor TV. The instructions, diagnostic results, etc. are given on the on-screen display (OSD).

6-2. STARTING TEST MODE

Press [TITLE], [CLEAR], [POWER] buttons on the remote commander in this order with the power of main unit in OFF status, and the Test Mode starts, then the menu shown below will be displayed on the TV screen. At the bottom of menu screen, the model name and revision number are displayed.
To execute each function, select the desired menu and press its number on the remote commander.
To exit from the Test Mode, press the POWER button.

```
         Test Mode Menu

0. Syscon Diagnosis
1. Drive Auto Adjustment
2. Drive Manual Operation
3. Mecha Aging
4. Emergency History
5. Version Information
6. Video Level Adjustment
                Exit: Power Key
_
Model    : DPX13xxxx
Revision   : 1.xxxx
```

6-3. SYSCON DIAGNOSIS

The same contents as board detail check by serial interface can be checked from the remote commander.
On the Test Mode Menu screen, press [0] key on the remote commander, and the following check menu will be displayed.

```
    ### Syscon Diagnosis ###
           Check Menu
0. Quit
1. All
2. Version
3. Peripheral
4. Servo
5. Supply
6. AV Decoder
7. Video
8. Audio
_
```

0. Quit
Quit the Syscon Diagnosis and return to the Test Mode Menu.

1. All
All items continuous check
This menu checks all diagnostic items continuously. Normally, all items are checked successively one after another automatically unless an error is found, but at a certain item that requires judgment through a visual check to the result, the following screen is displayed for the key entry.

```
    ### Syscon Diagnosis ###

         Diag All Check
         No. 2 Version

 2-3. ROM Check Sum
Check Sum = xxxx



Press NEXT Key to Continue
Press PREV Key to Repeat
_
```

For the ROM Check, the check sum calculated by the Syscon is output, and therefore you must compare it with the specified value for confirmation.
Following the message, press [NEXT] key to go to the next item, or [PREV] key to repeat the same check again. To quit the diagnosis and return to the Check Menu screen, press [STOP] or [ENTER] key. If an error occurred, the diagnosis is suspended and the error code is displayed as shown below.

```
    ### Syscon Diagnosis ###




 3-2. EEPROM Check
Error 03: EEPROM Write/Reed N
Address    : 00000001
Write Data : 2492
Read Data  : 2490
Press NEXT Key to Continue
Press PREV Key to Repeat
_
```

Press [STOP] key to quit the diagnosis, or [PREV] key to repeat the same item where an error occurred, or [NEXT] key to continue the check from the item next to faulty item.

Subnemu

Selecting 2 and subsequent items calls the submenu screen of each item.
For example, if “5. Supply” is selected, the following submenu will be displayed.

```
    ### Syscon Diagnosis ###
           Check Menu
          No. 5 Supply
0. Quit
1. All
2. ARP Register Check
3. ARP to RAM Data Bus
4. ARP to RAM Address Bus
5. ARP RAM Check
_
```

0. Quit
Quit the submenu and return to the main menu.

1. All

All submenu items continuous check
This menu checks 2 and subsequent items successively. At the item where visual check is required for judgment or an error occurred, the checking is suspended and the message is output for key entry. Normally, all items are checked successively one after another automatically unless an error is found.
Selecting 2 and subsequent items executes respective menus and outputs the results.
For the contents of each submenu, see “Check Items List”.

General Description of Checking Method

2. Version

(2-2) Revision
ROM revision number is displayed.
Error: Not detected.
The revision number defined in the source file of ROM (IC104) is displayed with four digits.

(2-3) ROM Check Sum
Check sum is calculated.
Error: Not detected.
The data are added of ROM (IC104) and the result is displayed with 4-digit hexadecimal number. Error is not detected. Compare the result with the specified value.

(2-4) Model Type
Model code is displayed.
Error: Not detected.
The model code is displayed with 2-digit hexadecimal number.

	Model Type	
DVP-K350 (CH)	3	6
DVP-K350 (HK, SP, TW)	3	7

- Abbreviation
  CH : Chinese model
  HK : Hong Kong model
  SP : Singapore model
  TW : Taiwan model

(2-5) Region
Region code is displayed.
Error: Not detected.
The region code determined from the model code is displayed.

3. Peripheral

(3-2) EEPROM Check
Data write → read, and accord check
Error 03: EEPROM write/read discord
Before writing, the data are saved, then after checking, they are written to restore the contents of EEPROM.

(3-3) Gate Array Check
Data write → read, and accord check
Error 02: Gate array write/read discord

4. Servo

(4-2) Servo DSP Check
Data write → read, and accord check
Error 12: Read data discord

(4-3) DSP Driver Test
Test signal data → DSP Driver
Error: Not detected.

5. Supply

Caution: Do not conduct this check with a mechanical deck connected.
An access is made to the stream supply and servo control IC (IC302) and external RAM (IC303) using check data. If mechanical deck is connected, the motor and optics could be damaged. This check is also executed by the “All” menu item.

Supplement: How to disconnect mechanical deck
Disconnect flexible flat cables connected to the CN201 and CN202 of MB-86 board. Also, disconnect flat cable from the CN401.

(5-2) ARP Register Check
Data write → read, and accord check
Error 08: ARP register write, and read data discord

(5-3) ARP to RAM Data Bus
Data write → read, and accord check
Error 09: ARP ←→ RAM data bus error
Data 0x0001 to 0x8000 where one bit each is set to 1 are written to the address 0 of RAM (IC303) connected to the ARP (IC302) through the bus, then they are read and checked. In case of discord, written bit pattern and read data are displayed. If data where multiple bits are 1 are read, the bits concerned may touch each other. Further, if data where certain bit is always 1 or 0 regardless of written data, the line could be disconnected or shorted.

(5-4) ARP to RAM Address Bus
Data write → other address read discord check
Error 10: ARP → RAM address bus error
Caution: Address and data display in case of an error is different from the display of other diagnosis (described later).
Before starting the test, all addresses of RAM (IC303) are cleared to 0x0000.
First, 0xA55A is written to the address 0x00000, and the address data are read and checked from addresses 0x00001 to 0x80000 while shifting 1 bit each. Next, the data at that address is cleared, and it is written to the address 0x00001, and read and checked in the same manner. This check is repeated up to the address 0x80000 while shifting the address data by 1 bit each.
If data other than 0 is read at the addresses except written address, an error is given because all addresses were already cleared to 0. In this check, the error display pattern is different from that of other diagnosis; read data, written address, and read address are displayed in this order. However, the message uses same template, and accordingly exchange Address and Data when reading. The following display, for example,

```
    ### Syscon Diagnosis ###



 5-4. ARP to RAM Address Bus
Error 10: ARP - RAM Address B
Address    : 0000A55A
Write Data : 00000000
Read Data  : 00080000
Press NEXT Key to Continue
Press PREV Key to Repeat
_
```

shows the data 0xA55A was read from address 0x00080000 though it was written to the address 0x00000000. This implies that these addresses are in the form of shadow. Also, if the read data is not 0xA55A, another error will be present.

(5-5) ARP RAM Check
Data write → read, and accord check
Error 11: ARP RAM read data discord
The program code data stored in ROM are copied to all areas of RAM (IC303) connected to the ARP (IC302) through the bus, then they are read and checked if they accord. If the detail check was selected initially, the data are written to all areas and read, then the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 11, and the test is suspended.

6. AV Decoder

(6-2) 1930 RAM
Data write → read, and accord check
Error 13: AVD RAM read data discord
The program code data stored in ROM (IC104) are copied to all areas of RAM (IC504, IC505) connected to the AVD (IC502) through the bus, then they are read and checked if they accord. Further, the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 13, and the test is suspended.

(6-3) 1930 SP
ROM → AVD RAM → Video OUT
Error: Not detected.
The data including sub picture streams in ROM (IC104) are transferred to the RAM (IC504, IC505) in AVD (IC502), and output as video signals from the AVD (IC502).
They are output from all video terminals (Composite, Y/C, Component).

7. Video

(7-2) Color Bar
AVD color bar command write → Video OUT
Error: Not detected.
The command is transferred to the AVD, and the color bar signals are output from video terminals.
They are output from all video terminals (Composite, Y/C, Component).

8. Audio

(8-2) ARP → 1930
Error 14 : ARP → 1930 video NG
15 : ARP → 1930 audio NG

(8-3) Test Tone
A pink noise signal is output from the AVD (IC502) through optical coaxial digital terminal and analog audio terminal.
Error: Not detected.
All channels → 2ch Left → 2ch Right are checked in this order.

Check Items List

2) Version
(2-2) Revision
(2-3) ROM Check Sum
(2-4) Model Type
(2-5) Region

3) Peripheral
(3-2) EEPROM Check
(3-3) Gate Array Check

4) Servo
(4-2) Servo DSP Check
(4-3) DSP Driver Test

5) Supply
(5-2) ARP Register Check
(5-3) ARP to RAM Data Bus
(5-4) ARP to RAM Address Bus
(5-5) ARP RAM Check

6) AV Decoder
(6-2) 1930 RAM
(6-3) 1930 SP

7) Video
(7-2) Color Bar

8) Audio
(8-2) ARP → 1930
(8-3) Test Tone

Error Codes List
00: Error not detected
01: RAM write/read data discord
02: Gate array NG
03: EEPROM NG
08: ARP register read data discord
09: ARP ←→ RAM data bus error
10: ARP ←→ RAM address bus error
11: ARP RAM read data discord
12: Servo DSP NG
13: 1930 SDRAM NG
14: ARP → 1930 video NG
15: ARP → 1930 audio NG
16: 1939 UCODE download NG
17: System call error (function not supported)
18: System call error (parameter error)
19: System call error (illegal ID number)
20: System call error (time out)
90: Error occurred
91: User verification NG
92: Diagnosis cancelled

6-4. DRIVE AUTO ADJUSTMENT

On the Test Mode Menu screen, press [1] key on the remote commander, and the drive auto adjustment menu will be displayed.

```
   ## Drive Auto Adjustment ##

         Adjustment Menu

0. ALL
1. DVD-SL
2. CD
3. DVD-DL
4. SACD



                    Exit: RETURN
```

Normally, [0] is selected to adjust DVD (single layer), CD, DVD (dual layer), and SACD in this order. But, individual items can be adjusted for the case where adjustment is suspended due to an error. In this mode, the adjustment can be made easily through the operation following the message displayed on the screen.
The disc used for adjustment must be the one specified for adjustment. However, for SACD disc, use the player with initial data if the disc is not available.

0. ALL

You will be asked if EEPROM data are initialized or not, and for this prompt, select [0] and press the [ENTER] key, and the servo set data in EEPROM will be initialized. Then, 1. DVD-SL disc, 2. CD disc, 3. DVD-DL disc, and 4. SACD disc are adjusted in this order. Each time one disc was adjusted, it is ejected. Replace it with the specified disc following the message. Though the message to confirm whether discs other than SACD disc are adjusted is not displayed, you can finish the adjustment if pressing the [STOP] button. The S curve level, RF level, and jitter value can be confirmed during adjustment, and if OK, press the [ENTER] key and continue adjustment. (If NG, press the [STOP] button) During adjustment of each disc, the measurement for disc type judgment is made. As automatic adjustment does not judge the disc type unlike conventional models, take care not to insert wrong type discs. Also, do not give a shock during adjustment.

1. DVD-SL (single layer)

Select [1], insert DVD single layer disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

DVD Single Layer Disc Adjustment Steps
1. SLED TILT Reset
2. Disc Check Memory SL
3. Wait 500 msec
4. Set Disc Type SL
5. LD ON
6. Spdl Start
7. Wait 1 sec
8. Focus Search ON
9. Focus Search OFF
10. Focus Servo ON 1
11. Auto Track Offset Adjust
12. Tracking ON
13. CLVA ON
14. Wait 1 sec
15. Sled ON
16. Check CLV Lock
17. Auto LFO Adjust
18. Auto Focus Offset Adjust
19. Auto Tilt Position Adjust
20. Auto Focus Gain Adjust
21. Auto Focus Offset Adjust
22. EQ Boost Adjust
23. Auto LFO Adjust
24. Auto Track Gain Adjust
25. All Servo Stop
26. EEPROM Copy Loop Filter Offset

2. CD

Select [2], insert CD disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

CD Adjustment Steps

1. Sled Tilt Rest
2. Disc Check Memory CD
3. Wait 500 msec
4. Set Disc Type CD
5. LD ON
6. Spdl Start
7. Wait 1 sec
8. Focus Search ON
9. Focus Search OFF
10. Focus Servo ON 1
11. Auto Track Offset Adjust
12. Tracking ON
13. (TC Display Start)
14. CLVA ON
15. Wait 1 sec
16. Jitter Display Start
17. Sled ON
18. Check CLV ON
19. Auto LFO Adjust
20. Auto Focus Offset Adjust
21. Auto Focus Gain Adjust
22. Auto Focus Offset Adjust
23. Eq Boost Adjust
24. Auto LFO Adjust
25. Auto Track Gain Adjust
26. All Servo Stop

3. DVD-DL (dual layer)

Select [3], insert DVD dual layer disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

DVD Dual Layer Disc Adjustment Steps

1. Sled Tilt Reset
2. Disc Check Memory DL
3. Wait 500 msec
4. Set Disc Type DL
5. LD ON
6. Spdl Start
7. Wait 1 sec

   Layer 1 Adjust
8. Focus Servo ON 1
9. Auto Track Offset Adjust
10. Tracking ON
11. Clva ON
12. Wait 1 sec
13. Sled ON
14. Check CLV Lock
15. Auto Loop Filter Offset Adjust
16. Auto Focus Offset Adjust
17. Auto Focus Gain Adjust
18. Auto Focus Offset Adjust
19. Eq Boost Adjust
20. Auto Loop Filter Offset
21. Auto Track Gain Adjust

    Layer 0 Adjust
22. Fj (L1 → L0)
23. Auto Track Offset Adjust L0
24. Tracking ON
25. Clva ON
26. Wait 1 sec
27. Sled ON
28. Check CLV Lock
29. Auto Loop Filter Offset Adjust
30. Auto Focus Offset Adjust
31. Auto Focus Gain Adjust
32. Auto Focus Offset Adjust
33. Eq Boost Adjust
34. Auto Loop Filter Offset
35. Auto Track Gain Adjust
36. All Servo Stop

4. SACD

Select [4], insert SACD disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM. However, if SACD disc is not available, use the player with initial data, skipping the SACD adjustment. In this case, you can finish the adjustment if pressing the [STOP] button.

SACD Adjustment Steps

1. Sled Tilt Reset
2. Set Disc Type CD
3. LD ON
4. Spdl Start
5. Wait 1 sec
6. Focus Servo ON 0
7. Auto track Offset Adjust
8. Tracking ON
9. CLVA ON
10. Wait 1 sec
11. Sled ON
12. Check CLV ON
13. Auto LFO Adjust
14. Auto Focus Offset Adjust
15. Auto Focus Gain Adjust
16. Auto Focus Offset Adjust
17. Eq Boost Adjust
18. Auto LFO Adjust
19. Auto Track Gain Adjust
20. All Servo Stop

6-5. DRIVE MANUAL OPERATION

On the Test Mode Menu screen, select [2], and the manual operation menu will be displayed. For the manual operation, each servo on/off control and adjustment can be executed manually.

```
  ## Drive Manual Operation ##

         Operation Menu
1. Disc type
2. Servo Control
3. Track/Layer Jump
4. Manual Adjustment
5. Auto Adjustment
6. Memory Check

0. Disc Check Memory

              Exit: Return
```

In using the manual operation menu, take care of the following points. These commands do not provide protection, thus requiring correct operation. The sector address or time code field is displayed when a disc is loaded.

1. Set correctly the disc type to be used on the Disc Type screen.
   The disc type must be set after a disc was loaded.
   The set disc type is cleared when the tray is opened.
2. After power ON, if the Drive Manual Operation was selected, first perform "Reset SLED TILT" by opening 1. Disc Type screen.
3. In case of an alarm, immediately press the [STOP] button to stop the servo operation, and turn the power OFF.

Basic operation (controllable from front panel or remote commander)

[POWER]	Power OFF
[STOP]	Servo stop
[OPEN/CLOSE]	Stop+Eject/Loading
[RETURN]	Return to Operation Menu or Test Mode Menu
[NEXT], [PREV]	Transition between sub modes of menu
[1] to [9], [0]	Selection of menu items
Cursor UP/DOWN	Increase/Decrease in manually adjusted value

0. Disc Check Memory

```
            Disc Check



1. SL Disc Check
2. CD Disc Check
3. DL Disc Check




0. Reset SLED TILT
```

On this screen, the mirror time is measured to judge the disc and it is written to the EEPROM. First load DVD SL disc and press [1], next load CD disc and press [2], and finally load DVD DL disc and press [3].
The adjustment must be executed more than once after default data were written. External vibration or shock to the player must not be given. Reference value for DVD is from 10 to 20, and for CD, from 28 to 4F.
Check that the value of CD is larger than that of DVD.
When those values are beyond a range perform this adjustment again.
From this screen, you can go to another mode by pressing [NEXT] or [PREV] key, but you cannot enter this mode from another mode. You can enter this mode from the Operation Menu screen only.

1. Disc Type

```
            Disc Type
1. Disc Type Auto Check
2. DVD SL   12 cm
3. DVD DL   12 cm
4. CD       12cm
5. SACD     12 cm
6. DVD SL   8 cm
7. DVD DL   8 cm
8. CD       8 cm
9. SACD     8 cm
0. Reset SLED TILT
                        EMG. 00
```

On this screen, select the disc type. To select the disc type, press the number of the loaded disc. The selected disc type is displayed at the bottom. Selecting [1] automatically selects and displays the disc type. In case of wrong display, retry “Disc Check Memory”. Also, opening the tray causes the set disc type to be cleared. In this case, set the disc type again after loading.
In performing manual operation, the disc type must be set.
Once the disc type has been selected, the sector address or time code display field will appear as shown below. These values are displayed when PLL is locked.

```
            Disc Type
1. Disc Type Auto Check
2. DVD SL   12 cm
3. DVD DL   12 cm
4. CD       12cm
5. SACD     12 cm
6. DVD SL   8 cm
7. DVD DL   8 cm
8. CD       8 cm
9. SACD     8 cm
0. Reset SLED TILT
        SA._____ SI.___ EMG. 00
DVD SL 12 cm
```

Display when DVD SL 12cm disc was selected

```
            Disc Type
1. Disc Type Auto Check
2. DVD SL   12 cm
3. DVD DL   12 cm
4. CD       12cm
5. SACD     12 cm
6. DVD SL   8 cm
7. DVD DL   8 cm
8. CD       8 cm
9. SACD     8 cm
0. Reset SLED TILT
         TC.___:___:___ EMG. 00
CD   12 cm
```

Display when CD 12cm disc was selected

[0] Reset SLED TILT	Reset the Sled and Tilt to initial position.
[1] Disk Type Check	Judge automatically the loaded disc. As the judged result is displayed at the bottom of screen, make sure that it is correct. If Disc Check Memory menu has not been executed after EEPROM default setting, the disc type cannot be judged. In this case, return to the initial menu and make a check for three types of discs (SL, DL, CD).
[2] to [9]	Select the loaded disc. The adjusted value is written to the address of selected disc. No further entry is necessary if [1] was selected.

2. Servo Control

```
         Servo Control
1. LD        Off R.Sled FWD
2. SP        Off L.Sled REV
3. Focus     Off U.Tilt Up
4. TRK.      Off D.Tilt Down
5. Sled      Off
6. CLVA      Off
7. FCS. Srch Off


0. Reset SLED TILT
        SA._____ SI.___ EMG. 00
DVD SL 12 cm
```

On this screen, the servo on/off control necessary for replay is executed. Normally, turn on each servo from 1 sequentially and when CLVA is turned on, the usual trace mode becomes active. In the trace mode, DVD sector address or CD time code is displayed. This is not displayed where the spindle is not locked.
The spindle could run overriding the control if the spindle system is faulty or RF is not present. In such a case, do not operate CLVA.

[0]	Reset SLED TILT	Reset the Sled and Tilt to initial position.
[1]	LD	Turn ON/OFF the laser.
[2]	SP	Turn ON/OFF the spindle.
[3]	Focus	Search the focus and turn on the focus.
[4]	TRK	Turn ON/OFF the tracking servo.
[5]	Sled	Turn ON/OFF the sled servo.
[6]	CLVA	Turn ON/OFF normal servo of spindle servo.
[7]	FCS. Srch	Apply same voltage as that of focus search to the focus drive to check the focus drive system.
[→]	Sled FWD	Move the sled outward. Perform this operation with the tracking servo turned off.
[←]	Sled REV	Move the sled inward. Perform this operation with the tracking servo turned off.
[↑]	Tilt UP	Move the tilt upward.
[↓]	Tilt DOWN	Move the tilt downward.

The following menus are normally not used.

3. Track/Layer Jump
4. Manual Adjustment
5. Auto Adjustment

The persons who do not know well about these menus should not use them.

6. Memory Check

```
EEPROM DATA             -- DL --
             CD SACD  SL  L0  L1
Focus Gain    xx xx   xx  xx  xx
TRK. Gain     xx xx   xx  xx  xx
Focus Offset  xx xx   xx  xx  xx
TRK. Offset   xx xx   xx  xx  xx
L. F. Offset  xx xx   xx  xx  xx
Analog FRSW   xx xx   xx  xx  xx
PLL DAC Gain  xx xx   xx  xx  xx
EQ Boost      xx xx   xx  xx  xx
Jitter        xx xx   xx  xx  xx
Mirror Time   xx      xx  xx
_             CLEAR: Default Set
```

This screen displays current servo adjusted data stored in the EEPROM. Though adjusted data can be initialized with the [CLEAR] key, they cannot be restored after initialization.
So, before clearing, make a note of the adjusted data.
For reference, the drive has been designed so that the gain center value is 20 and offset value is 80. Other values will be in a range of 10 to 80. If extreme value such as 00 or FF is set, adjustment will be faulty. In such a case, check for disc scratch or cable disconnection, then perform adjustment again.

6-6. MECHA AGING

```
       ### Mecha Aging ###



Press OPEN key



Abort: STOP key
```

On the Test Mode Menu screen, selecting [3] executes the aging of mechanism. First, open the tray and load a disc. Press the [PLAY] key, and the aging will start. When the tray is closed, the disc type and size are judged and displayed. During aging, the repeat cycle is displayed. Aging can be aborted at any time by pressing the [STOP] key. After the operation has stopped, unload the disc and press again the [STOP] key or the [RETURN] key to return to the Test Mode Menu.

6-7. EMERGENCY HISTORY

```
      ### MEG. History ###

Laser Hours     CD   xxxxxxxh
                DVD  xxxxxxxh

1. 00 00 00 00  00 00 00 00
   00 00 00 00  00 00 00 00

2. 00 00 00 00  00 00 00 00
   00 00 00 00  00 00 00 00

Select: 1 – 9   Scroll: UP/DOWN
(1: Last EMG.)   Exit: Return
```

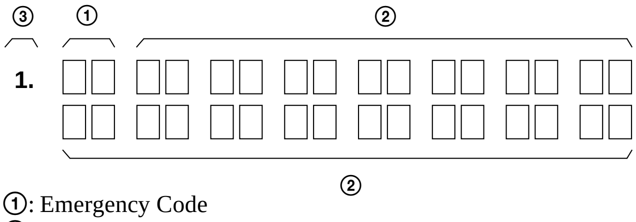
On the Test Mode Menu screen, selecting [4] displays the information such as servo emergency history. The history information from last 1 up to 10 can be scrolled with [↑] key or [↓] key. Also, specific information can be displayed by directly entering that number with ten keys.

The upper two lines display the laser ON total hours. Data below minutes are omitted.

Clearing History Information

Clearing laser hours
◎ Press [DISPLAY] and [CLEAR] keys in this order.
Both CD and DVD data are cleared.
Clearing emergency history
◎ Press [TITLE] and [CLEAR] keys in this order.
Initializing set up data
◎ Press [DVD] and [CLEAR] keys in this order.
The data have been initialized when “Set Up Initialized” message is displayed. The EMG. History screen will be restored soon.

How to see Emergency History



①: Emergency Code
②: Don't Care
These codes are used for verification of software designing.
③: Historical order 1 to 9

Emergency Codes List

10: Communication to IC201 (MB-86 board) failed.
11: Each servo for focus, tracking, and spindle is unlocked.
12: Communication to EEPROM, IC101 (MB-86 board) failed.
13: Writing of hours meter data to EEPROM, IC101 (MB-86 board) failed.
14: Communication to Servo DSP IC404 (MB-86 board) failed, or Servo DSP is faulty.
20: Initialization of tilt servo and sled servo failed. They are not placed in the initial position.
21: Tilt servo operation error
22: Syscon made a request to move the tilt servo to wrong position.
23: Sled servo operation error
24: Syscon made a request to move the sled servo to wrong position.
30: Tracking balance adjustment error
31: Tracking gain adjustment error
32: Focus balance adjustment error
33: Focus bias adjustment error
34: Focus gain adjustment error
35: Tilt servo adjustment error
36: RF equalizer adjustment error
37: RF group delay adjustment error
38: Jitter value after adaptive servo operation is too large.
40: Focus servo does not operate.
41: With a dual layer (DL) disc, focus jump failed.
50: CLV (spindle) servo does not operate.
51: Spindle does not stop.
60: With a DVD disc, Syscon made a request to seek nonexistent address.
61: With a CD disc, Syscon made a request to seek nonexistent address.
62: With a CD disc, Syscon made a request to seek nonexistent track No. and index No.
63: With a DVD disc, seeking of target address failed.
64: With a CD disc, seeking of target address failed.
65: With a CD disc, seeking of target index failed.
70: With a DVD disc, physical information data could not be read.
71: With a CD disc, TOC data could not be read.
80: Disc type judgment failed.
81: As disc type judgment failed, retry was repeated.
82: As disc type judgment failed, a measurement error occurred.
83: Disc type could not be judged within the specified time.
84: Illegal command code was received from Syscon.
85: Illegal command was received from Syscon.

6-8. VERSION INFORMATION

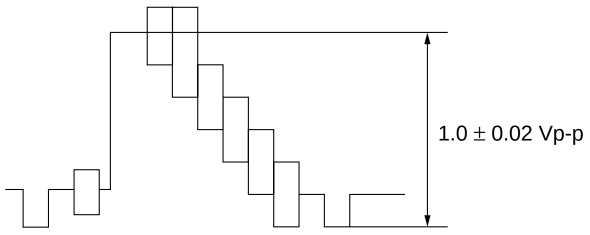
```
    ## Version Information ##

IF con.    Ver. x. xxx (xxxx)
           Group    00

SYScon.    Ver. x. xxx (xxxx)
           Model    xx
           Region   0x
Servo DSP. Ver. 1. xxxx


Exit: RETURN
```

On the Test Mode Menu screen, selecting [5] displays the ROM version and region code.
The parenthesized hexadecimal number in version field is checksum value of ROM.

6-9. VIDEO LEVEL ADJUSTMENT

On the Test Mode Menu screen, selecting [6] displays color bars for video level adjustment. During display of color bars, OSD disappears but the menu screen will be restored if pressing any key.

Measurement point : LINE OUT VIDEO
(75 Ω terminating resistance)
Measuring instrument : Oscilloscope
Adjustment device : RV501 on MB-86 board
Specified value : 1.0 ± 0.02 Vp-p



6-10. IF CON SELF DIAGNOSTIC FUNCTION

1. AI-19 BOARD (IF CON) TEST MODE

The AI-19 board (IF CON) test mode is the IF CON self diagnostic mode. The IF CON can diagnose the functions of the front panel boards that the IF CON controls. Normally, the IF CON makes a serial communication with the SYSTEM CONTROL and operates following thecommands from the SYSTEM CONTROL, but in the Test mode, the IF CON operates independently from the SYSTEM CONTROL.

In the Test mode, the following functions can be checked.

1. Button function
2. Remocon receiving function
3. SYSTEM CONTROL-IF CON serial communication
4. Click shuttle function
5. Fluorescent display tube lighting check
   Grid check
   Anode check
6. LED control function

In the Test mode, the set operates same as usual, except voltage monitoring, communication monitoring, display of fluorescent display tube, and LED control.

1. The routine that monitors +3.3 V (PCONT) of MB-86 board is not provided.
2. The monitoring timer for serial communication with the SYSTEM CONTROL is not provided. The set is not placed in the Standby mode, even if the communication with SYSTEM CONTROL is normal.
3. Display of fluorescent display tube (normally, display is made following the commands from SYSTEM CONTROL)
4. LED control (normally, control is made following the commands from SYSTEM CONTROL)

2. OPERATION OF SELF CHECK MODE

The Self Check mode is the function to conduct the basic test to the FL display and DVD panel section.

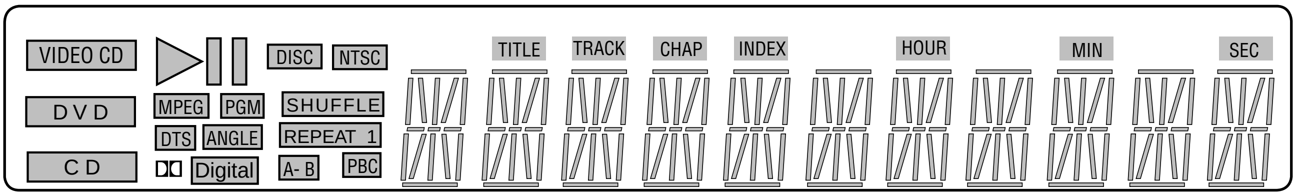
2-1. Self Check Mode Transition Processing

At the AC Power ON after IF CON was reset, the input to 8pin (SELF CHECK) of IC502 is judged and if “Low” is entered, the main unit transits to the Self Check mode. In this port input judgment, the result of 3-time attempts must be same (assuming that the MB-86 board is not connected). While pressing the [STOP] key on the main unit with the IF CON in STANDBY mode, enter [RETURN] → [DISPLAY] (or [SET UP]) on the remote commander, and the unit transits to the Self Check Mode. The Self Check mode terminates when the IF CON transits to the STANDBY mode.

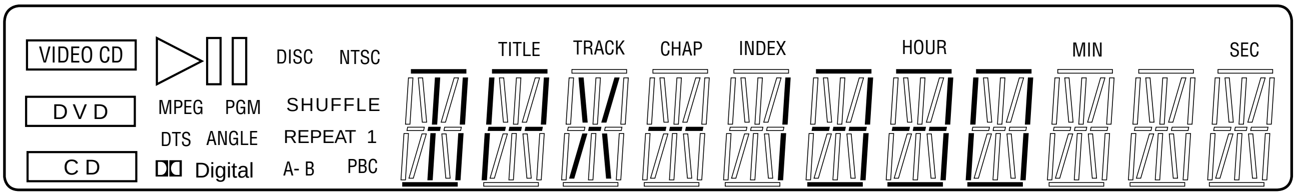
2-2. Operation of Auto Self Check

When the Self Check mode becomes active at the AC Power ON or by key input, the test display of the following steps (1) to (4) is repeated.

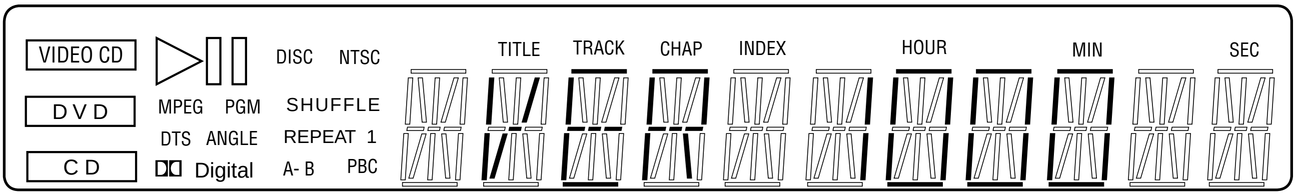
(1) FLD and LED all ON (for 5 seconds)



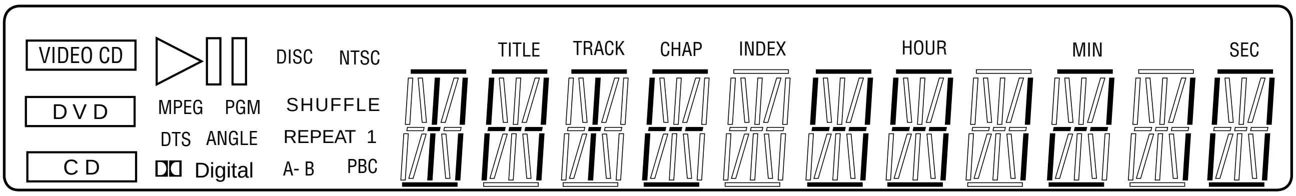
(2) MODEL display (for 2 seconds)



(3) Version display (for 2 seconds)



(4) ROM creation date display (for 2 seconds)



2-3. Each Self Check Function

Each Self Check function tests the FLD display, LED display, and key input.

Input Voltage [V]	IC502: Pin No. (Signal)				
	Pin ③ (AN3)	Pin ② (AN4)	Pin ① (AN5)	Pin ⑳ (AN6)	Pin ⑲ (AN7)
0	STOP	TITLE	RIGHT	VOCAL	VES
0.70	PAUSE	DVD MENU	UP	VOCAL SELECT	♯
1.31	DISPLAY	NEXT	ENTER	VOCAL SUPPORT	♮
1.97	RETURN	PREV	DOWN	KARAOKE STAR	♭
2.59	RESERVE		LEFT		
3.3					

2-3-1. FLD and LED All ON

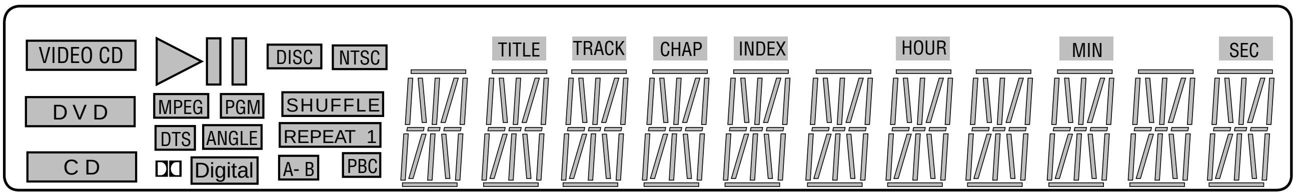
2-3-1-1. Transition Keys in Self Check Mode

- STOP key and PLAY key on the main unit
- LEFT key on the main unit and the remote commander

2-3-1-2. Operation and Display

In this mode, all LEDs except STANDBY LED and all segments of FLD turn ON.

Example of FLD all ON



2-3-2. Main Unit Key Name Display and Key Code Display

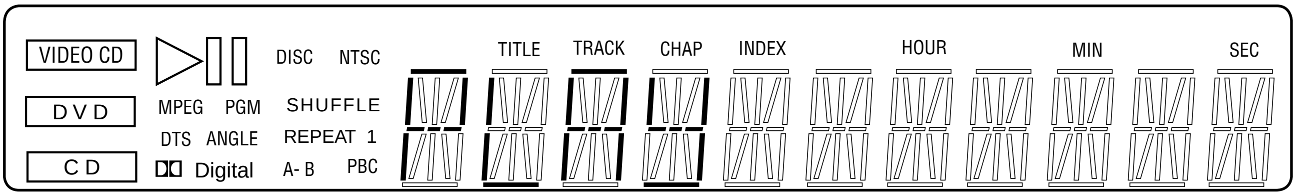
2-3-2-1. Transition Keys in Self Check Mode

- Keys on main unit except keys transited in self check

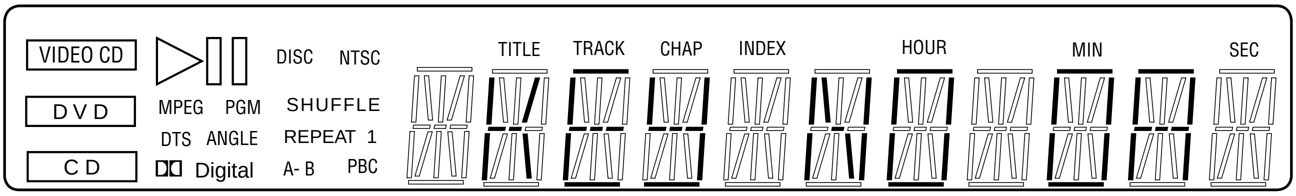
2-3-2-2. Operation and Display

When a key on the main unit is pressed in the Self Check mode, the name of that key is displayed on the FLD. Also, the key name display and the key code display can be switched with the DIS-PLAY key on the remote commander. "NOTHING" is displayed when nothing is entered. Also, VIDEO CD, DVD, and CD segments turn on when a communication error occurred.

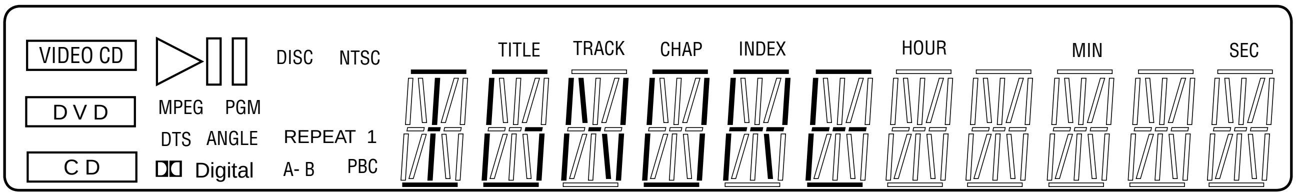
FLD display (at input of PLAY key on the main unit)



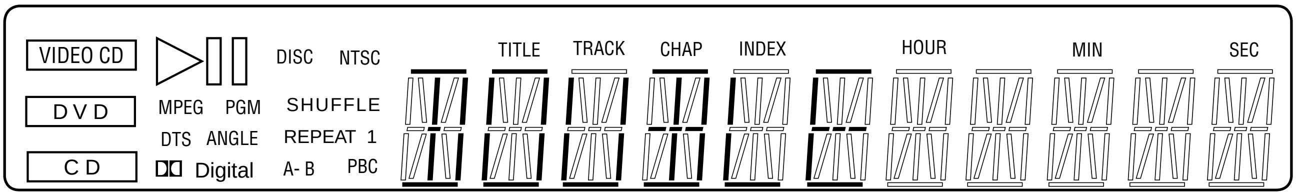
Key code display (at input of PLAY key, Key code: 0Ah)



At input of faulty voltage



When two keys are pressed



2-3-3. Remote Commander Key Name Display and Key Code Display

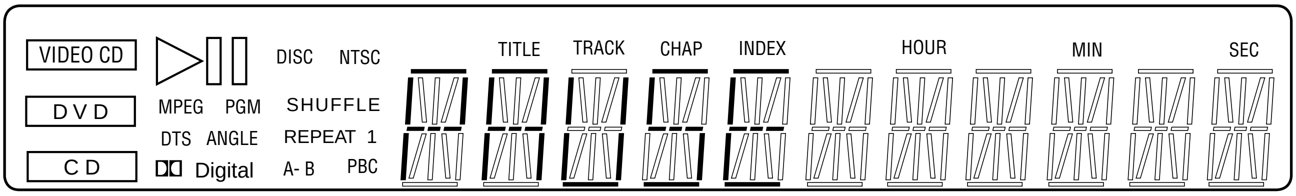
2-3-3-1. Transition Keys in Self Check Mode

- Remote commander keys except keys transited in self check

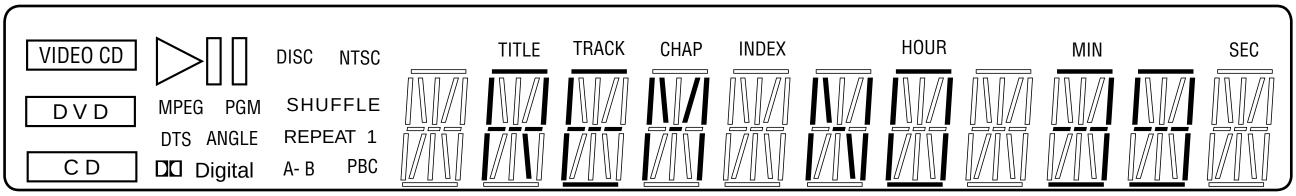
2-3-3-2. Operation and Display

When a key on the remote commander is pressed in the Self Check mode, the name of that key is displayed on the FLD. Also, the key name display and the key code display can be switched with the DISPLAY key on the remote commander. “NOTHING” is displayed when nothing is entered. Also, VIDEO CD, DVD, and CD segments turn on when a communication error occurred.

Remote commander key name display (at input of PAUSE key)



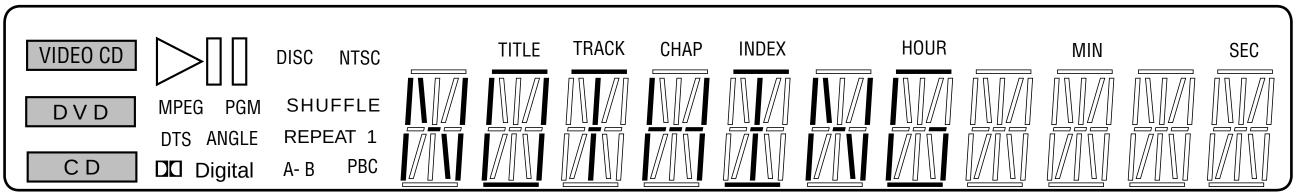
Remote commander key code display (at input of PAUSE key, Key code: 39h)



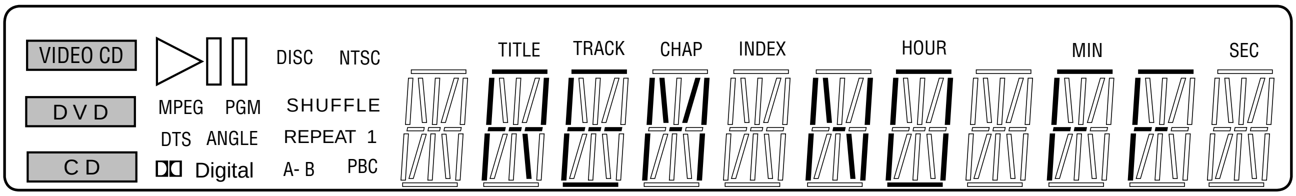
2-3-4. Communication Monitoring Display

The communication state is monitored and displayed while the key name on the main unit and the remote commander is displayed. When the communication to the System Controller failed, VIDEO CD, DVD, and CD segments turn on.

Communication error display (at no key input)



Communication error display (at code display without input of the remote commander)



2-3-5. FLD Anode Test Display and SHUTTLE Click Operation Test

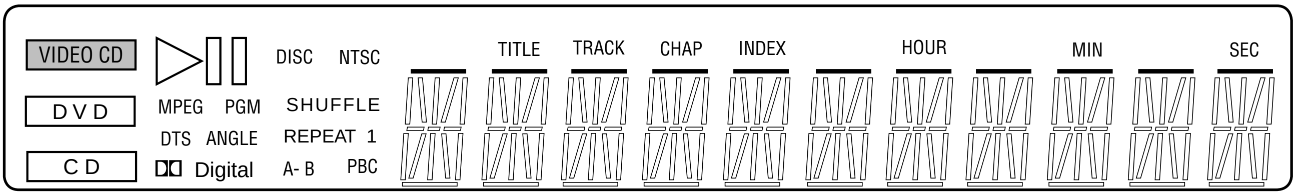
2-3-5-1. Transition Keys in Self Check Mode

- RIGHT on the main unit and the remote commander
- SHUTTLE on the main unit and the remote commander during Anode Test display

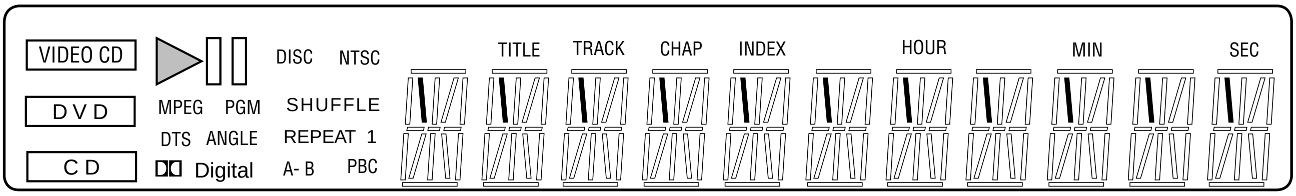
2-3-5-2. Operation and Display

The Self Check mode transits to this mode when RIGHT key is entered. Only the first segment of each grid of FLD turns on, and each time the SHUTTLE is entered, the segment of each grid is switched in order. When SHUTTLE input is clockwise, the segment switches in 1 → 2 → 3 direction, or counterclockwise it switches in 3 → 2 → 1 direction. This tests whether each segment turns on individually. Also, if the main unit does not have the JOG/SHUTTLE, use the remote commander JOG/SHUTTLE to switch over the segment display position.

Display at the start of Anode Test



↓ (Input in CW direction)



2-3-6. FLD Grid Test Display and SHUTTLE Click Operation Test

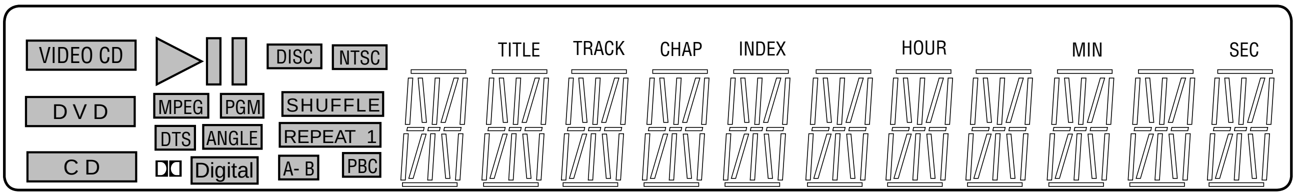
2-3-6-1. Transition Keys in Self Check Mode

- UP on the main unit and the remote commander
- SHUTTLE on the main unit and the remote commander during Grid Test display

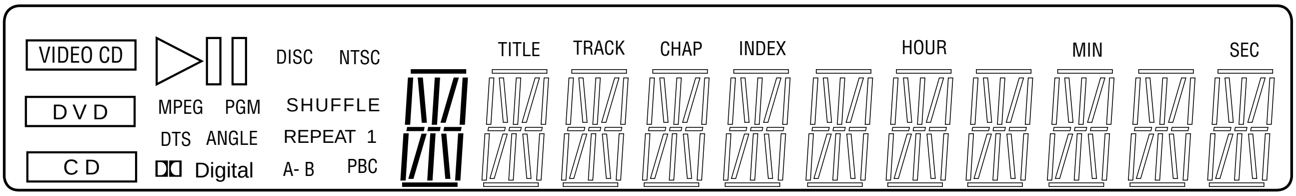
2-3-6-2. Operation and Display

The Self Check mode transits to this mode when UP key is entered. The first grid of FLD all turns on and other grids turn off. Each time the SHUTTLE is entered, the grid is switched in order. When SHUTTLE input is clockwise, the grid switches in 1 → 2 → 3 direction, or counterclockwise it switches in 3 → 2 → 1 direction. This tests whether each grid turns on individually.

Display at the start of Grid Test



↓ (Input in CW direction)



2-3-7. LED Test Display

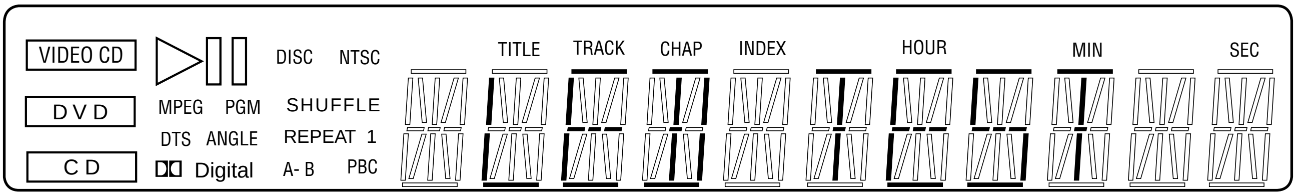
2-3-7-1. Transition Keys in Self Check Mode

- DOWN on the main unit and the remote commander
- SHUTTLE on the main unit and the remote commander during LED Test display

2-3-7-2. Operation and Display

LED is switched in order by the input of JOG/SHUTTLE. Also, LED ON/OFF is switched by the input of same key as the function that turns on the LED concerned. For the MULTI LED only, there is no key which switches that function, and therefore use the RETURN key on the main unit.

FLD display during LED Test



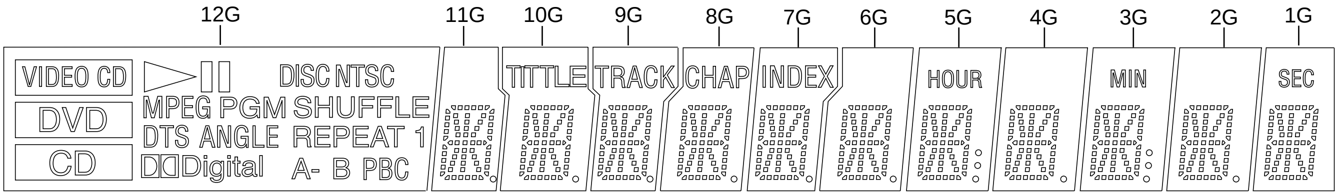
2-3-8. Beep Sound Test

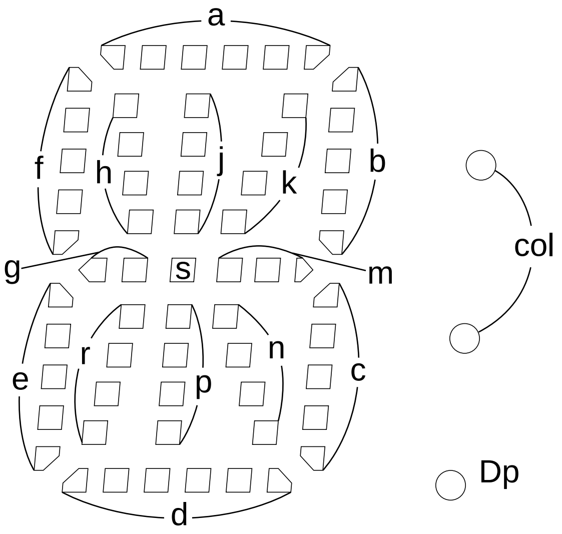
2-3-8-1. Transition Keys in Self Check Mode

- Input of a key on main unit

2-3-8-2. Operation and Display

In the Self Check mode, each time a key on the main unit is entered, a beep sound of 2kHz (100ms) is generated.





(12G~1G)

ANODE CONNECTION

	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	VIDEO CD	a	a	a	a	a	a	a	a	a	a	a
P2	▷	h	h	h	h	h	h	h	h	h	h	h
P3	▯▯	j	j	j	j	j	j	j	j	j	j	j
P4	DISC	k	k	k	k	k	k	k	k	k	k	k
P5	NTSC	b	b	b	b	b	b	b	b	b	b	b
P6	DVD	f	f	f	f	f	f	f	f	f	f	f
P7	MPEG	m	m	m	m	m	m	m	m	m	m	m
P8	PGM	s	s	s	s	s	s	s	s	s	s	s
P9	SHUFFLE	g	g	g	g	g	g	g	g	g	g	g
P10	DTS	e	e	e	e	e	e	e	e	e	e	e
P11	ANGLE	n	n	n	n	n	n	n	n	n	n	n
P12	REPEAT	p	p	p	p	p	p	p	p	p	p	p
P13	1	r	r	r	r	r	r	r	r	r	r	r
P14	PBC	c	c	c	c	c	c	c	c	c	c	c
P15	B	d	d	d	d	d	d	d	d	d	d	d
P16	A-	Dp	Dp	Dp	Dp	Dp	Dp	Dp	Dp	Dp	Dp	-
P17	Digital	-	-	-	-	-	-	col	-	col	-	-
P18	CD	-	TITLE	TRACK	CHAP	INDEX	-	HOUR	-	MIN	-	SEC

3. TROUBLESHOOTING

3-1. Test Mode is not activated

With the set assembled in the front panel, the Test mode does not become active if any button was pressed by any reason.Under this condition, the power is not turned on even in the normal status. (The set is kept in Standby status = Red LED is kept on) Not only the buttons are inactive, but also a signal from remote commander is not accepted. To check this condition, with the self check port (pin ⑧ of IF CON) kept in "Low" status, supply the AC power, so that the Test mode is forcibly activated. On the board, short the lands where SELF is printed. The IF CON checks the self check port only after the power on reset (only when AC is supplied; not in Standby status). If any button was pressed, the button name should be displayed on the FL display tube. Though no button is pressed this time, display of other than NOTHING implies that the button was pressed.

3-2. Power is not turned on

① Red (STANDBY) LED does not light up when AC was supplied. The power (EVER 3.3 V) is not supplied.
X401 is oscillating.

② Red (STANDBY) LED is kept on though POWER button was pressed. Any button is kept pressed.
PONCHK (IF CON pin ⑥) is over 0.1 V.

③ Green LED lights up when POWER button was pressed, but red LED lights up again after several seconds. PONCHK (IF CON pin ⑥) is abnormal. (Slow rise time from 0.1 V to 1.5 V. Voltage must be less than 1.5 V)
SYSTEM CONTROL does not operate normally.

3-3. Power is turned on and off repeatedly

EVER 3.3 V may not be supplied normaly. Check that D430 is not broken.

SECTION 7
ELECTRICAL ADJUSTMENT

In making adjustment, refer to 7-3. Adjustment Related Parts Arrangement.

Note: During diagnostic check, the characters and color bars can be seen only with the NTSC monitor. Therefore, for diagnostic check, use the monitor that supports both NTSC and PAL modes.

This section describes procedures and instructions necessary for adjusting electrical circuits in this set.

Instruments required:

1) Color monitor TV
2) Oscilloscope 1 or 2 phenomena, band width over 100 MHz, with delay mode
3) Frequency counter (over 8 digits)
4) Digital voltmeter
5) Standard commander (RMT-D118E)
6) DVD reference disc
   HLX-501 (J-6090-071-A) (dual layer)
   HLX-503 (J-6090-069-A) (single layer)
   HLX-504 (J-6090-088-A) (single layer)
   HLX-505 (J-6090-089-A) (dual layer)
7) SACD reference disc
   HLXA-509 (J-6090-090-A)
8) Extension cable (J-6090-100-A)
   MB-86 BOARD (CN501) ←→ AI-19 BOARD (CN101)
   MB-86 BOARD (CN701) ←→ AI-19 BOARD (CN201)

7-1. POWER SUPPLY ADJUSTMENT

1. Power Supply Check (HS16S9E/HS16S9F BOARD)

Mode	E-E
Instrument	Digital voltmeter
EVER +3 V Check	
Test point	CN201 pin ①
Specification	3.6 ± 0.2 Vdc
SW +3 V Check	
Test point	CN201 pin ②, ③
Specification	3.4 ± 0.2 Vdc
EVER+5 V Check	
Test point	CN201 pin ④
Specification	5.3 ± 0.3 Vdc
SW +10 V Check	
Test point	CN201 pin ⑦, ⑧
Specification	$10.5 ^{+1.0}_{-1.5}$ Vdc
SW –10 V Check	
Test point	CN201 pin ⑪
Specification	$-10.0 ^{+1.5}_{-1.0}$ Vdc

Checking method:

1) Confirm that each voltage satisfies the specification.

7-2. ADJUSTMENT OF VIDEO SYSTEM

1. Video Level Adjustment (MB-86 BOARD)

<Purpose>

This adjustment is made to satisfy the NTSC standard, and if not adjusted correctly, the brightness will be too large or small.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	LINE OUT (VIDEO) connector (75 Ω terminated)
Instrument	Oscilloscope
Adjusting element	RV501
Specification	1.0 ± 0.02 Vp-p

Adjusting method:

1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
2) Adjust the RV501 to attain 1.0 ± 0.02 Vp-p.

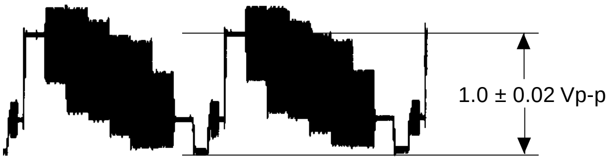


Figure 7-1

2. S-terminal Output Check (MB-86 BOARD)

<Purpose>

Check S-terminal video output. If it is incorrect, pictures will not be displayed correctly in spite of connection to the TV with a S-terminal cable.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	S VIDEO OUT (S-Y) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	1.0 ± 0.1 Vp-p

Checking method:

1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
2) Confirm that the S-Y level is 1.0 ± 0.1 Vp-p.

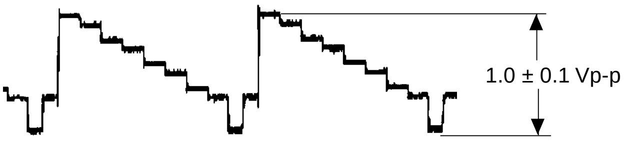


Figure 7-2

3. Checking Component Video Output B-Y (MB-86 BOARD)

<Purpose>

This checks component video output B-Y. If it is incorrect, correct colors will not be displayed when connected to, for instance, projector.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (B-Y) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	700 ± 70 mVp-p

Checking method:

1) Confirm that the B-Y level is 700 ± 70 mVp-p.

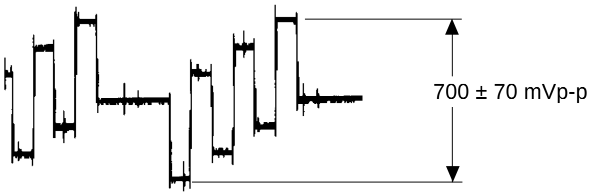


Figure 7-3

4. Checking Component Video Output R-Y (MB-86 BOARD)

<Purpose>

This checks component video output R-Y. If it is incorrect, correct colors will not be displayed when connected to, for instance, projector.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (R-Y) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	700 ± 70 mVp-p

Checking method:

1) Confirm that the R-Y level is 700 ± 70 mVp-p.

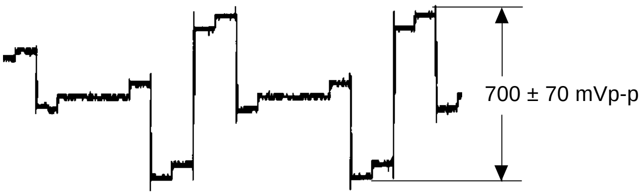


Figure 7-4

5. Checking Component Video Output Y (MB-86 BOARD)

<Purpose>

This checks component video output Y. If it is incorrect, correct brightness will not be attained when connected to, for instance, projector.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (Y) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	1.0 ± 0.1 Vp-p

Checking method:

1) Confirm that the Y level is 1.0 ± 0.1 Vp-p.

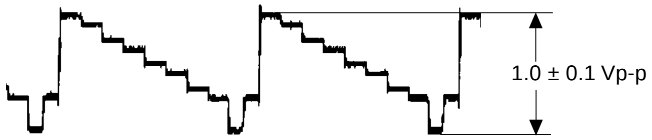


Figure 7-5

6. Checking S Video Output S-C (MB-86 BOARD)

<Purpose>

This checks whether the S-C satisfies the NTSC Standard. If it is not correct, the colors will be too dark or light.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	S VIDEO OUT (S-C) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	286 ± 50 mVp-p (NTSC) 300 ± 100 mVp-p (PAL)

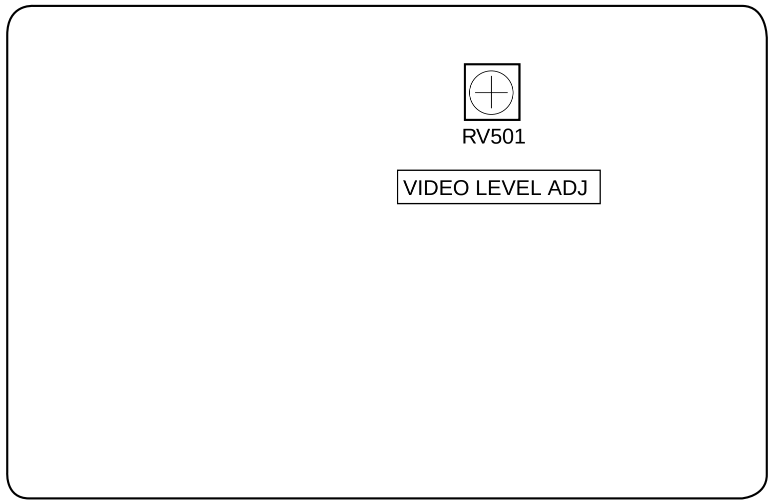
Checking method:

1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
2) Confirm that the S-C burst is 300 ± 100 mVp-p.

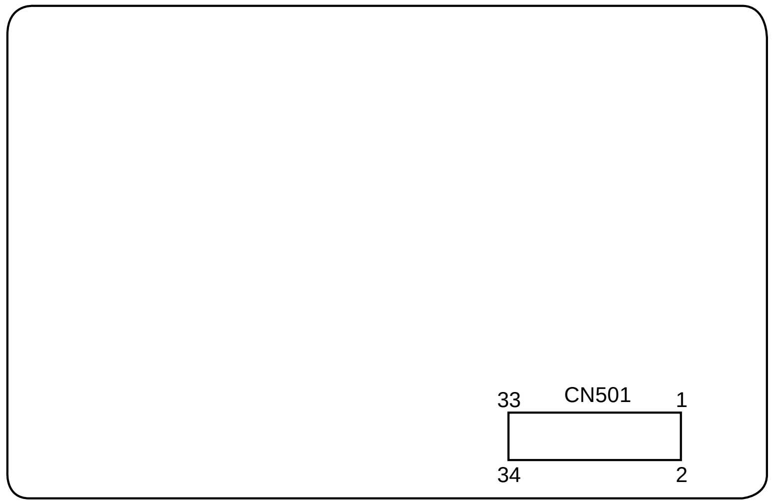
Figure 7-6

7-3. ADJUSTMENT RELATED PARTS ARRANGEMENT

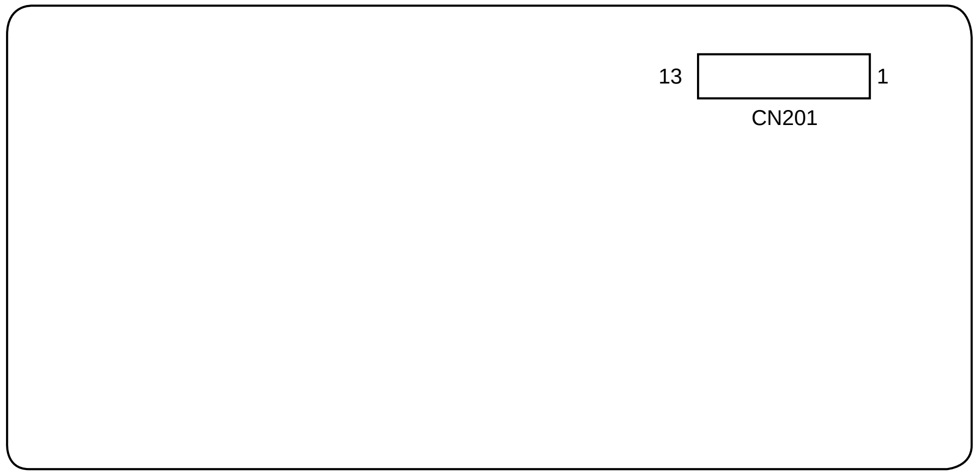
MB-86 BOARD (SIDE A)



MB-86 BOARD (SIDE B)



HS16S9E/HS16S9F BOARD (COMPONENT SIDE)



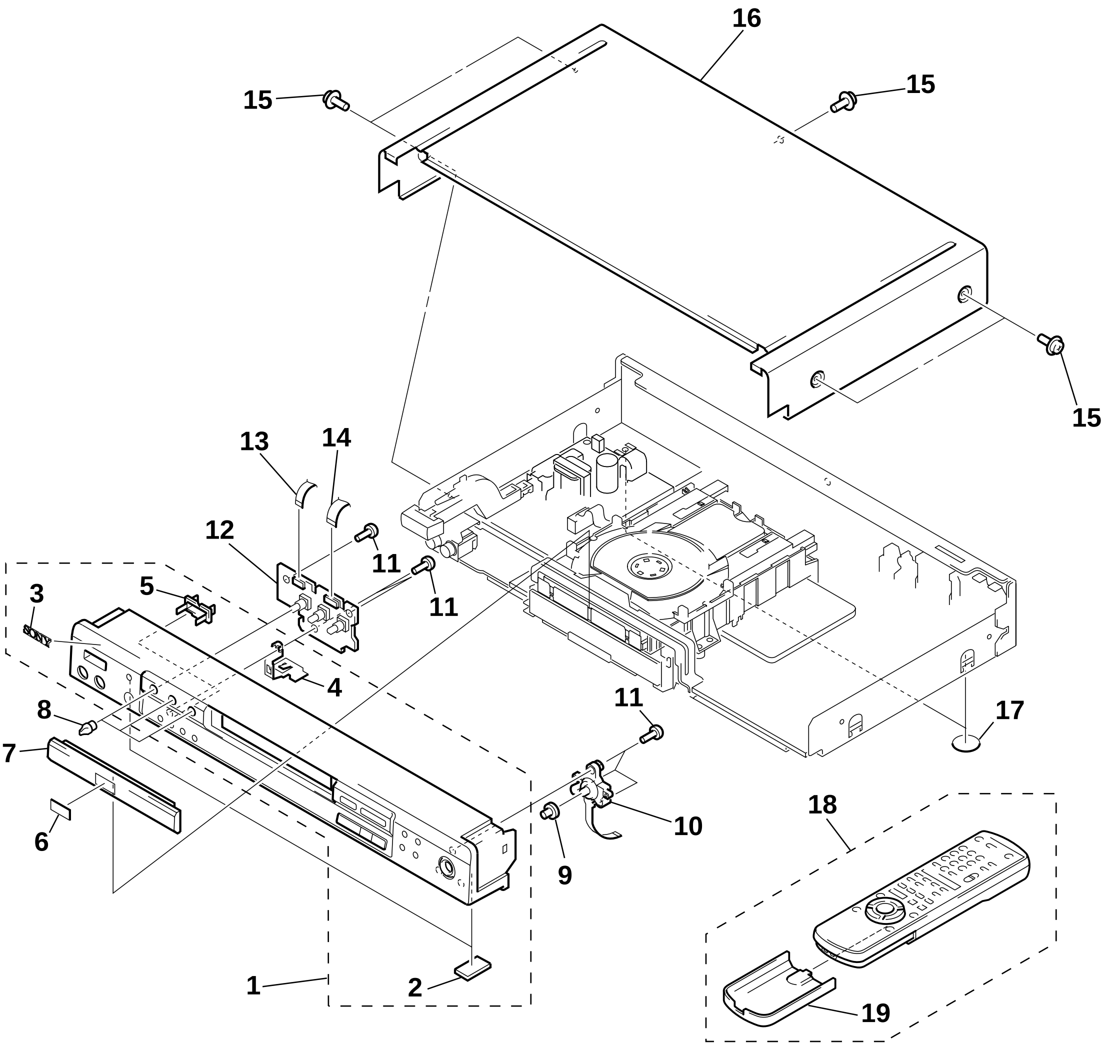
SECTION 8
REPAIR PARTS LIST

8-1. EXPLODED VIEWS

NOTE:
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Abbreviation
  CH : Chinese model   SP : Singapore model
  HK : Hong Kong model   TW : Taiwan model
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of the electrical parts list.

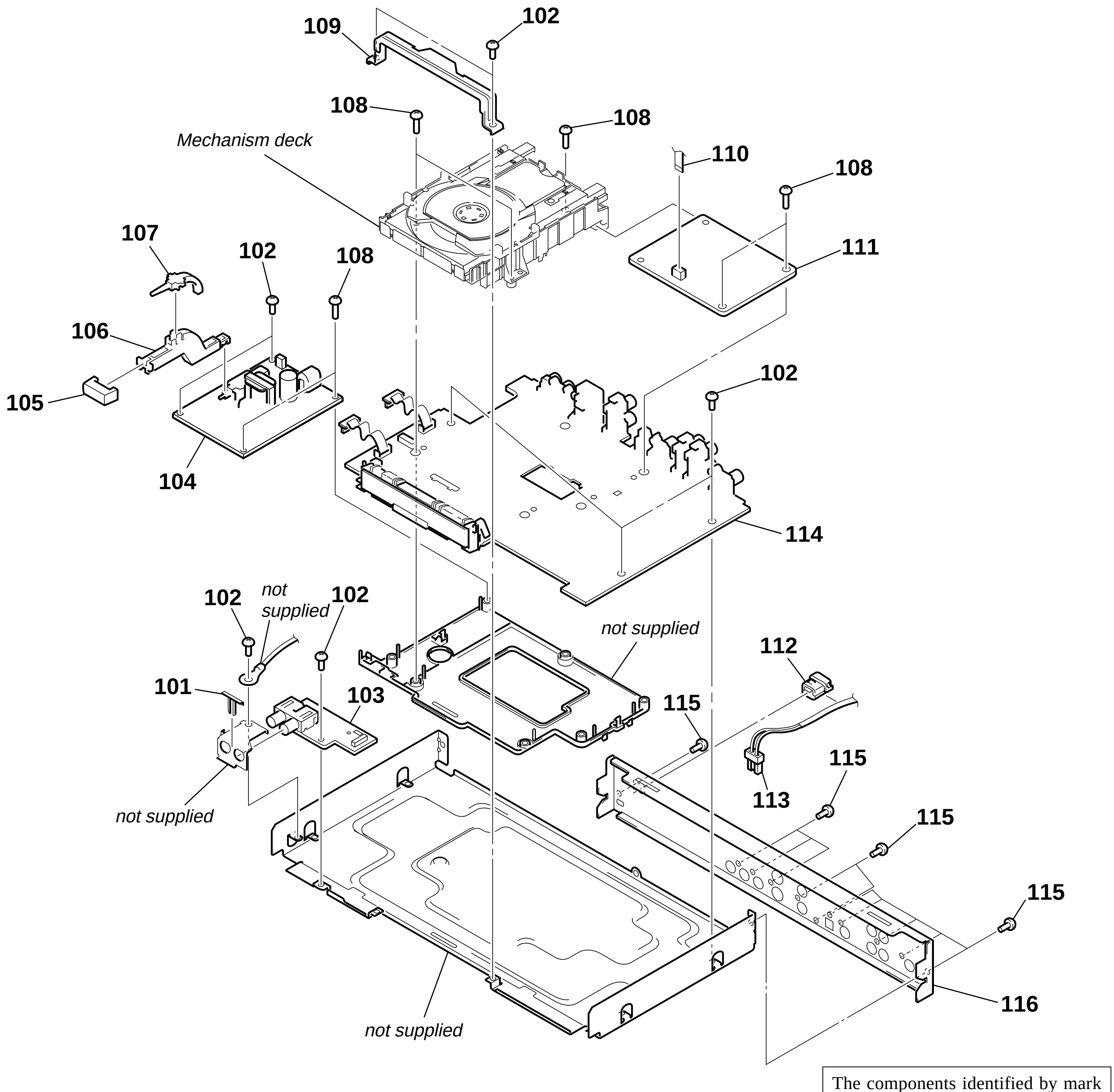
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

8-1-1. CASE ASSEMBLY



Ref. No.	Part No.	Description	Remark
1	X-3950-704-1	PANEL ASSY, FRONT (HK, SP)	
1	X-3950-903-1	PANEL ASSY, FRONT (TW, CH)	
2	3-059-349-11	CUSHION, FOOT	
3	4-963-404-41	EMBLEM (5-A), SONY	
4	3-061-782-01	PLATE (F), GROUND	
5	3-061-780-01	PLATE, SHIELD	
6	3-975-726-81	EMBLEM, DVD	
7	3-059-377-21	COVER, TRAY (TW, CH)	
7	3-059-377-51	COVER, TRAY (HK, SP)	
8	3-059-379-21	KNOB, VOLUME (TW, CH)	
8	3-059-379-51	KNOB, VOLUME (HK, SP)	
9	3-059-322-21	STICK, CURSOR (TW, CH)	
9	3-059-322-51	STICK, CURSOR (HK, SP)	
10	1-771-913-11	SWITCH, TACTILE	
11	3-970-608-51	SUMITITE (B3), +BV	
* 12	A-6065-547-A	SW-340 BOARD, COMPLETE (HK, SP, CH)	
* 12	A-6065-560-A	SW-340 BOARD, COMPLETE (TW)	
13	1-757-039-11	CABLE, FLEXIBLE FLAT (FMS-015)	
14	1-757-040-11	CABLE, FLEXIBLE FLAT (FAS-001)	
15	3-710-901-61	SCREW, TAPPING	
16	3-062-941-11	CASE	
17	3-059-331-01	FOOT, REAR (TW)	
17	3-059-389-01	CUSHION (REAR), FOOT (HK, SP, CH)	
18	1-418-991-41	COMMANDER, STANDARD (RMT-D118E)	
19	3-053-633-01	COVER, BATTERY (for RMT-D118E)	

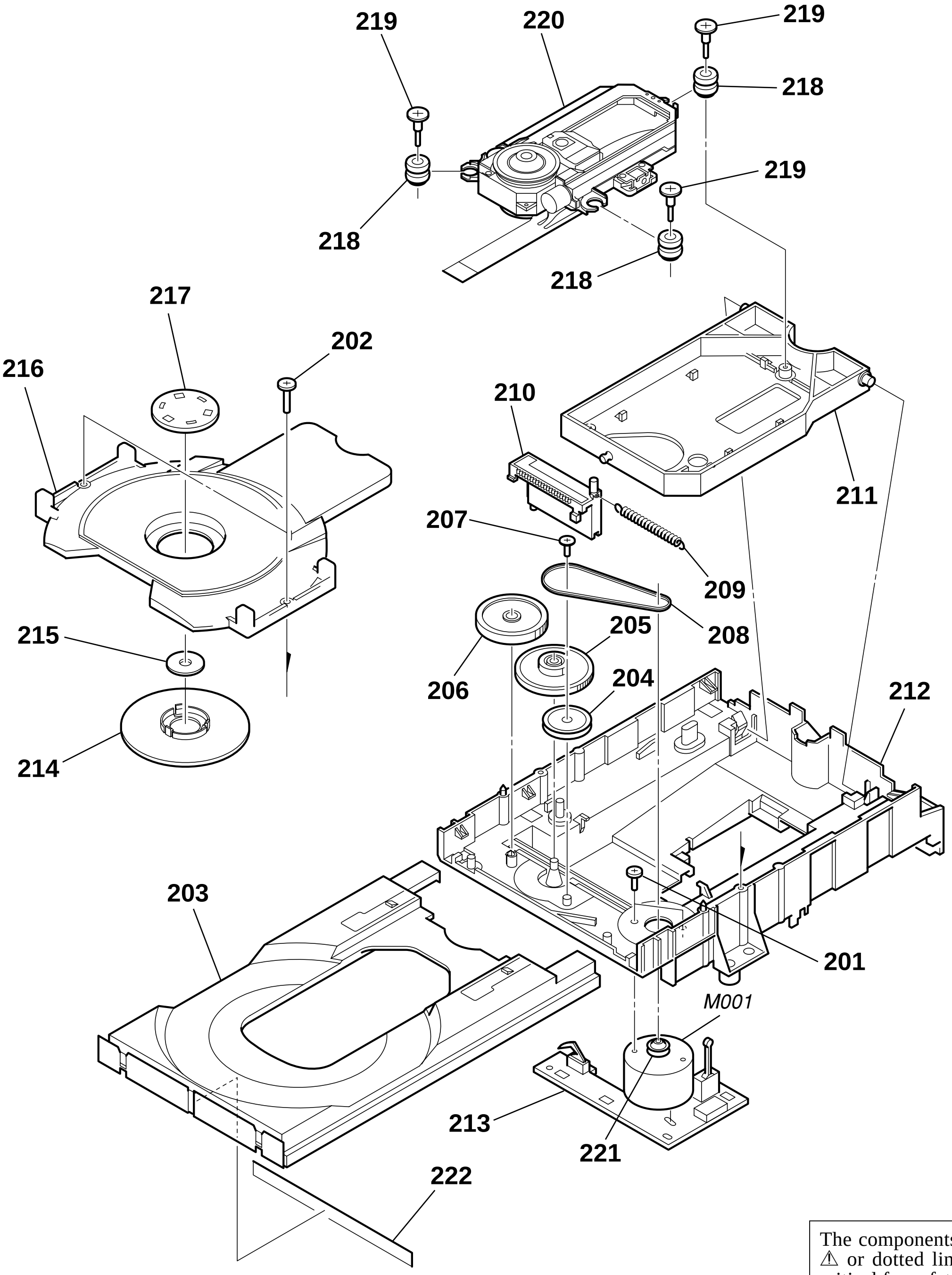
8-1-2. CHASSIS ASSEMBLY



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
101	3-955-377-01	PLATE (2GANG), MOUNT	
102	3-970-608-01	SUMITITE (B3), +BV	
* 103	A-6065-544-A	MC-126 BOARD, COMPLETE (HK, SP, CH)	
* 103	A-6065-561-A	MC-126 BOARD, COMPLETE (TW)	
* 104	1-468-506-11	POWER BLOCK (HS16S9F) (TW)	
* 104	1-468-506-31	POWER BLOCK (HS16S9E) (HK, SP, CH)	
105	3-059-319-21	BUTTON, POWER (TW, CH)	
105	3-059-319-51	BUTTON, POWER (HK, SP)	
106	3-059-320-01	JOINT (P) (TW, CH)	
106	3-059-320-11	JOINT (P) (HK, SP)	
107	3-059-321-01	INDICATOR (P) (TW, CH)	
107	3-059-321-11	INDICATOR (P) (HK, SP)	
108	3-061-608-01	POINT (ROUND), +BV S TITE FRONT	
109	3-059-388-01	PILLAR, MULTI (HK, SP)	
109	3-059-388-11	PILLAR, MULTI (TW, CH)	
110	1-792-457-11	CABLE, FLEXIBLE FLAT (FMM-33)	
* 111	A-6065-546-A	MB-86 BOARD, COMPLETE (HK, SP)	
* 111	A-6065-559-A	MB-86 BOARD, COMPLETE (CH)	
* 111	A-6065-563-A	MB-86 BOARD, COMPLETE (TW)	
112	4-966-267-12	BUSHING (FBS001), CORD	
⚠113	1-769-744-91	CORD, POWER (HK, SP)	
⚠113	1-782-510-11	CORD, POWER (CH)	
⚠113	1-790-380-11	CORD, POWER (TW)	
* 114	A-6065-545-A	AI-19 BOARD, COMPLETE (HK, SP, CH)	
* 114	A-6065-641-A	AI-19 BOARD, COMPLETE (TW)	
115	3-970-608-51	SUMITITE (B3), +BV	
116	3-059-326-11	PANEL, REAR (TW, CH)	
116	3-059-390-11	PANEL, REAR (HK, SP)	

8-1-3. MECHANISM DECK SECTION



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
201	7-621-775-10	SCREW +B 2.6X4	
202	7-685-648-79	SCREW +BVTP 3X12 TYPE2 IT-3	
203	3-053-837-11	TRAY	
204	3-053-841-01	PULLEY GEAR	
205	3-053-840-01	CAM DRIVING GEAR	
206	3-053-839-01	TRAY DRIVING GEAR	
207	4-974-711-01	SCREW (2X5) (P TYIGHT), (+) PTTWH	
208	3-053-842-01	BELT	
209	3-053-849-01	SPRING, TENSION	
210	3-053-838-01	CHUCK CAM	
211	3-059-557-11	HOLDER, BASE UNIT	
212	3-059-556-11	BASE, LOADING	
* 213	A-6066-016-A	MS-48 BOARD, COMPLETE	
214	3-053-845-01	CHUCK PLATE	
215	3-053-844-01	YOKE	
216	3-059-558-11	HOLDER, CHUCK	
217	3-053-846-01	YOKE HOLDER	
218	3-053-847-01	INSULATOR	
219	4-981-923-01	SCREW (M), STEP	
⚠220	A-6062-397-A	OPTICAL PICK-UP KHM-220AAA/J1RP	
221	3-053-843-01	MOTOR PULLEY	
222	3-055-097-01	SEAL, TRAY DUST	
M001	1-541-632-11	MOTOR, DC (LOADING)	

8-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- Not all of the parts for POWER BLOCK (HS16S9E and HS16S9F) are listed.
- Items marked "*" are not stocked since they are seldom required for routine service.
  Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA. . : μA. .   uPA. .   : μPA. .
  uPB. .   : μPB. .   uPC. .   : μPC. .
  uPD. .   : μPD. .
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

- Abbreviation
  CH : Chinese model
  HK : Hong Kong model
  SP : Singapore model
  TW : Taiwan model

Ref. No.	Part No.	Description			Remark
*	A-6065-545-A	AI-19 BOARD, COMPLETE (HK, SP, CH)			
*	A-6065-641-A	AI-19 BOARD, COMPLETE (TW)			
		*********************			
		(Ref. No. 2,000 Series)			
	3-059-329-01	HOLDER (T), FL			
	3-059-330-01	HOLDER (U), FL			
		< BUZZER >			
BZ501	1-504-920-11	BUZZER			
		< CAPACITOR >			
C101	1-110-501-11	CERAMIC CHIP	0.33uF	10%	16V
C102	1-104-664-11	ELECT	47uF	20%	16V
C103	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C104	1-104-665-11	ELECT	100uF	20%	25V
C105	1-128-551-11	ELECT	22uF	20%	25V
C106	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C107	1-128-551-11	ELECT	22uF	20%	25V
C108	1-128-551-11	ELECT	22uF	20%	25V
C109	1-128-551-11	ELECT	22uF	20%	25V
C110	1-128-551-11	ELECT	22uF	20%	25V
C111	1-115-340-11	CERAMIC CHIP	0.22uF	10%	25V
C112	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C113	1-104-664-11	ELECT	47uF	20%	25V
C114	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C202	1-126-960-11	ELECT	1uF	20%	50V
C203	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C204	1-104-664-11	ELECT	47uF	20%	16V
C205	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C206	1-104-665-11	ELECT	100uF	20%	10V
C207	1-126-960-11	ELECT	1uF	20%	50V
C209	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C210	1-128-131-11	ELECT	22uF	20%	50V
C211	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C213	1-126-933-11	ELECT	100uF	20%	16V
C215	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C216	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C217	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C219	1-126-965-11	ELECT	22uF	20%	50V
C220	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C221	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C222	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V

Ref. No.	Part No.	Description			Remark
C223	1-126-964-11	ELECT	10uF	20%	50V
C225	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C226	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C227	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C228	1-126-963-11	ELECT	4.7uF	20%	50V
C229	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C230	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C231	1-126-965-11	ELECT	22uF	20%	50V
C232	1-126-963-11	ELECT	4.7uF	20%	50V
C233	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C234	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C235	1-163-255-11	CERAMIC CHIP	150PF	5%	50V
C236	1-163-255-11	CERAMIC CHIP	150PF	5%	50V
C237	1-163-255-11	CERAMIC CHIP	150PF	5%	50V
C238	1-126-934-11	ELECT	220uF	20%	16V
C239	1-163-255-11	CERAMIC CHIP	150PF	5%	50V
C240	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C241	1-126-934-11	ELECT	220uF	20%	10V
C242	1-126-934-11	ELECT	220uF	20%	10V
C243	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C244	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C245	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C246	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C247	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C248	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C249	1-104-665-11	ELECT	100uF	20%	10V
C250	1-104-665-11	ELECT	100uF	20%	10V
C255	1-126-965-11	ELECT	22uF	20%	50V
C256	1-126-965-11	ELECT	22uF	20%	50V
C257	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C259	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C261	1-126-965-11	ELECT	22uF	20%	50V
C262	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C263	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C264	1-126-933-11	ELECT	100uF	20%	16V
C265	1-126-933-11	ELECT	100uF	20%	16V
C266	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C268	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C269	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C271	1-124-589-11	ELECT	47uF	20%	16V
C272	1-126-964-11	ELECT	10uF	20%	50V
C275	1-106-353-00	MYLAR	0.0027uF	5%	50V
C276	1-106-353-00	MYLAR	0.0027uF	5%	50V

Ref. No.	Part No.	Description			Remark
C278	1-124-589-11	ELECT	47uF	20%	16V
C279	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C280	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C282	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C283	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C284	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C285	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C401	1-104-664-11	ELECT	47uF	20%	16V
C402	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C403	1-104-664-11	ELECT	47uF	20%	16V
C404	1-126-963-11	ELECT	4.7uF	20%	50V
C405	1-104-664-11	ELECT	47uF	20%	16V
C406	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C407	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C408	1-128-551-11	ELECT	22uF	20%	25V
C409	1-104-665-11	ELECT	100uF	20%	10V
C410	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C411	1-104-664-11	ELECT	47uF	20%	16V
C412	1-128-551-11	ELECT	22uF	20%	25V
C413	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C414	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C416	1-126-963-11	ELECT	4.7uF	20%	50V
C417	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C418	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C419	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C421	1-126-963-11	ELECT	4.7uF	20%	50V
C422	1-126-964-11	ELECT	10uF	20%	50V
C423	1-128-551-11	ELECT	22uF	20%	25V
C424	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C425	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C426	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C427	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C428	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C429	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C430	1-126-964-11	ELECT	10uF	20%	50V
C431	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C432	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C433	1-126-960-11	ELECT	1uF	20%	50V
C434	1-126-964-11	ELECT	10uF	20%	50V
C435	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C436	1-104-664-11	ELECT	47uF	20%	16V
C437	1-104-664-11	ELECT	47uF	20%	16V
C501	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C502	1-124-589-11	ELECT	47uF	20%	16V
C503	1-125-972-91	ELECT	100uF	20%	16V
C505	1-124-261-00	ELECT	10uF	20%	50V (HK, SP, CH)
C508	1-124-584-00	ELECT	100uF	20%	10V
C509	1-104-664-11	ELECT	47uF	20%	16V
C510	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C511	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C512	1-126-924-11	ELECT	330uF	20%	6.3V
C513	1-104-664-11	ELECT	47uF	20%	16V
C514	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C515	1-124-584-00	ELECT	100uF	20%	10V
C516	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C517	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C518	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C519	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C521	1-128-131-11	ELECT	22uF	20%	50V
C522	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C523	1-109-982-11	CERAMIC CHIP	1uF	10%	10V (TW)
C524	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C525	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C526	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C527	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C529	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C534	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C536	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C537	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C538	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C539	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C540	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C541	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C542	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V

< CONNECTOR >

Ref. No.	Part No.	Description
CN101	1-794-325-11	CONNECTOR, BOARD TO BOARD 34P
CN201	1-794-325-11	CONNECTOR, BOARD TO BOARD 34P
CN501	1-778-317-11	CONNECTOR, BOARD TO BOARD 13P
CN502	1-785-694-11	CONNECTOR, FFC/FPC 7P
CN503	1-785-695-11	CONNECTOR, FFC/FPC 13P
CN504	1-568-788-21	PIN, CONNECTOR 11P
CN505	1-784-641-11	CONNECTOR, BOARD TO BOARD 11P

< DIODE >

Ref. No.	Part No.	Description	
D101	8-719-071-15	DIODE	HZM6.8ZWA1TL
D102	8-719-071-15	DIODE	HZM6.8ZWA1TL
D103	8-719-071-15	DIODE	HZM6.8ZWA1TL
D104	8-719-071-15	DIODE	HZM6.8ZWA1TL
D201	8-719-072-27	DIODE	MA2Z748001S0
D202	8-719-988-61	DIODE	1SS355TE-17
D203	8-719-988-61	DIODE	1SS355TE-17
D204	8-719-988-61	DIODE	1SS355TE-17
D205	8-719-988-61	DIODE	1SS355TE-17
D207	8-719-914-43	DIODE	DAN202K-T-146
D208	8-719-914-43	DIODE	DAN202K-T-146
D401	8-719-988-61	DIODE	1SS355TE-17
D402	8-719-988-61	DIODE	1SS355TE-17
D403	8-719-988-61	DIODE	1SS355TE-17
D502	8-719-041-97	DIODE	MA113- (TX)
D503	8-719-041-97	DIODE	MA113- (TX)
D504	8-719-041-97	DIODE	MA113- (TX)
D505	8-719-041-97	DIODE	MA113- (TX)
D507	8-719-914-44	DIODE	DAP202K-T-146
D509	8-719-988-61	DIODE	1SS355TE-17
D511	8-719-422-70	DIODE	MA8075-TX (HK, SP, CH)
D511	8-719-422-62	DIODE	MA8062-L-TX (TW)
D512	8-719-056-06	DIODE	SLR-342DCT32 (RESERVE)
D513	8-719-058-24	DIODE	RB501V-40TE-17 (HK, SP, CH)
D514	8-719-988-61	DIODE	1SS355TE-17 (HK, SP, CH)
D516	8-719-069-54	DIODE	UDZS-TE17-5.1B

< EARTH TERMINAL >

Ref. No.	Part No.	Description
* ET501	1-537-738-21	TERMINAL, EARTH
* ET502	1-537-738-21	TERMINAL, EARTH
* ET503	1-537-738-21	TERMINAL, EARTH

Ref. No.	Part No.	Description		Remark
		< FERRITE BEAD >		
FB101	1-414-766-22	INDUCTOR CHIP	0uH	
FB102	1-414-766-22	INDUCTOR CHIP	0uH	
FB103	1-414-766-22	INDUCTOR CHIP	0uH	
FB104	1-414-766-22	INDUCTOR CHIP	0uH	
FB105	1-414-766-22	INDUCTOR CHIP	0uH	
FB106	1-414-766-22	INDUCTOR CHIP	0uH	
FB107	1-414-766-22	INDUCTOR CHIP	0uH	
FB108	1-414-766-22	INDUCTOR CHIP	0uH	
FB109	1-414-766-22	INDUCTOR CHIP	0uH	
FB201	1-469-324-21	FERRITE	0uH	
FB202	1-469-324-21	FERRITE	0uH	
FB501	1-469-324-21	FERRITE	0uH (TW)	
FB502	1-469-324-21	FERRITE	0uH	
FB504	1-469-324-21	FERRITE	0uH	
FB505	1-469-324-21	FERRITE	0uH	
FB506	1-469-324-21	FERRITE	0uH	
FB507	1-469-324-21	FERRITE	0uH	
FB508	1-469-324-21	FERRITE	0uH	
FB509	1-469-324-21	FERRITE	0uH (TW)	
		< IC >		
IC101	8-759-667-18	IC PQ018EZ01ZP		
IC102	8-759-667-17	IC L79M05TLL-SONY-TL		
IC103	8-759-667-63	IC LA7109-TLM		
IC201	8-759-052-52	IC L78M05TLL-SONY-TL		
IC202	8-759-667-19	IC uPC29M08T-E1		
IC203	7-759-667-85	IC CXD9545Q		
IC204	8-759-669-29	IC CXD9544MR		
IC205	8-759-377-65	IC LC78817M-TE-L		
IC206	8-759-909-71	IC BA4558F-E2		
IC207	8-759-909-71	IC BA4558F-E2		
IC208	8-759-909-71	IC BA4558F-E2		
IC209	8-759-909-71	IC BA4558F-E2		
IC210	8-749-921-12	IC GP1F32T (OPTICAL)		
IC401	8-759-363-77	IC MSM6654A-454GS-KDR1		
IC402	8-759-701-51	IC NJM2072M (TE2)		
IC403	8-759-100-96	IC NJM4558M-TE2		
IC404	8-759-668-02	IC YSS915-ME2		
IC501	8-759-521-90	IC PQ05DZ5U		
IC502	8-759-669-95	IC M38B57M6-147FP		
IC503	8-759-673-34	IC PST7030MT		
IC504	8-759-671-84	IC AN77033SP- (E1) (HK, SP, CH)		
		< JACK >		
J101	1-694-484-21	TERMINAL, S (2P.V) (S VIDEO OUT)		
J102	1-793-445-11	JACK, PIN 3P (COMPONENT VIDEO OUT)		
J103	1-793-475-21	JACK, PIN 2P (VIDEO OUT)		
J201	1-793-446-11	JACK, PIN 1P (WOOFER)		
J202	1-793-446-21	JACK, PIN 1P (COAXIAL)		
J203	1-793-526-21	JACK, PIN 4P (AUDIO OUT)		
		< JUMPER RESISTOR >		
JR001	1-216-295-91	SHORT	0	
JR002	1-216-296-91	SHORT	0	
JR003	1-216-296-91	SHORT	0	
JR004	1-216-295-91	SHORT	0	
JR005	1-216-296-91	SHORT	0	
JR006	1-216-295-91	SHORT	0	
JR007	1-216-295-91	SHORT	0	
JR008	1-216-295-91	SHORT	0	
JR009	1-216-296-91	SHORT	0	
JR010	1-216-296-91	SHORT	0	
JR011	1-216-295-91	SHORT	0	
JR012	1-216-296-91	SHORT	0	
JR013	1-216-296-91	SHORT	0	
JR014	1-216-295-91	SHORT	0	
JR015	1-216-296-91	SHORT	0	
JR016	1-216-296-91	SHORT	0	
JR017	1-216-296-91	SHORT	0	
JR018	1-216-295-91	SHORT	0	
JR019	1-216-296-91	SHORT	0	
JR020	1-216-295-91	SHORT	0	
JR021	1-216-296-91	SHORT	0	
JR022	1-216-296-91	SHORT	0	
JR023	1-216-296-91	SHORT	0	
JR024	1-216-296-91	SHORT	0	
JR025	1-216-296-91	SHORT	0	
JR026	1-216-295-91	SHORT	0	
JR027	1-216-296-91	SHORT	0	
JR028	1-216-296-91	SHORT	0	
JR029	1-216-295-91	SHORT	0	
JR030	1-216-295-91	SHORT	0	
JR031	1-216-296-91	SHORT	0	
JR032	1-216-295-91	SHORT	0	
JR033	1-216-296-91	SHORT	0	
JR034	1-216-296-91	SHORT	0	
JR035	1-216-296-91	SHORT	0	
JR036	1-216-295-91	SHORT	0	
JR037	1-216-296-91	SHORT	0	
JR038	1-216-296-91	SHORT	0	
JR039	1-216-295-91	SHORT	0	
JR040	1-216-295-91	SHORT	0	
JR041	1-216-296-91	SHORT	0	
JR042	1-216-295-91	SHORT	0	
JR043	1-216-295-91	SHORT	0	
JR044	1-216-295-91	SHORT	0	
JR045	1-216-296-91	SHORT	0	
JR046	1-216-296-91	SHORT	0	
JR047	1-216-295-91	SHORT	0	
JR048	1-216-296-91	SHORT	0	
JR049	1-216-296-91	SHORT	0	
JR050	1-216-295-91	SHORT	0	
JR051	1-216-295-91	SHORT	0	
JR052	1-216-296-91	SHORT	0	
JR053	1-216-296-91	SHORT	0	
JR054	1-216-295-91	SHORT	0	
JR055	1-216-295-91	SHORT	0	
JR056	1-216-295-91	SHORT	0	
JR057	1-216-296-91	SHORT	0	
JR058	1-216-296-91	SHORT	0	
JR059	1-216-295-91	SHORT	0	
JR060	1-216-296-91	SHORT	0	
JR061	1-216-296-91	SHORT	0	
JR062	1-216-296-91	SHORT	0	
JR063	1-216-295-91	SHORT	0	
JR064	1-216-295-91	SHORT	0	
JR065	1-216-296-91	SHORT	0	
JR066	1-216-296-91	SHORT	0	

Ref. No.	Part No.	Description			Remark
JR067	1-216-296-91	SHORT	0		
JR068	1-216-296-91	SHORT	0		
JR069	1-216-295-91	SHORT	0		
JR070	1-216-296-91	SHORT	0		
JR071	1-216-296-91	SHORT	0		
JR072	1-216-296-91	SHORT	0		
JR073	1-216-296-91	SHORT	0		
JR074	1-216-295-91	SHORT	0		
		< COIL >			
L501	1-408-978-21	INDUCTOR	47uH		
		< FLUORESCENT INDICATOR >			
ND501	1-517-972-11	INDICATOR TUBE, FLUORESCENT			
		< IC LINK >			
⚠PS501	1-532-679-00	LINK, IC (0.6A)			
⚠PS502	1-532-605-00	LINK, IC (0.4A)			
		< TRANSISTOR >			
Q101	8-729-421-19	TRANSISTOR	UN2213-TX		
Q102	8-729-424-08	TRANSISTOR	UN2111-TX		
Q201	8-729-230-72	TRANSISTOR	2SA1362-YG-EL		
Q202	8-729-421-19	TRANSISTOR	UN2213-TX		
Q203	8-729-424-08	TRANSISTOR	UN2111-TX		
Q204	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX).SO		
Q205	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX).SO		
Q206	8-729-027-53	TRANSISTOR	DTC124TKA-T146		
Q207	8-729-216-22	TRANSISTOR	2SB709A-QRS-TX		
Q208	8-729-421-19	TRANSISTOR	UN2213-TX		
Q209	8-729-421-19	TRANSISTOR	UN2213-TX		
Q210	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX).SO		
Q211	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX).SO		
Q212	8-729-230-49	TRANSISTOR	2SC2712-YG-TE85L		
Q213	8-729-216-22	TRANSISTOR	2SB709A-QRS-TX		
Q214	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX).SO		
Q215	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX).SO		
Q216	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX).SO		
Q218	8-729-230-49	TRANSISTOR	2SC2712-YG-TE85L		
Q401	8-729-424-18	TRANSISTOR	UN2113-TX		
Q402	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX).SO		
Q403	8-729-421-22	TRANSISTOR	UN2211-TX		
Q404	8-729-424-08	TRANSISTOR	UN2111-TX		
Q405	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX).SO		
Q406	8-729-421-19	TRANSISTOR	UN2213-TX		
Q407	8-729-424-08	TRANSISTOR	UN2111-TX		
Q408	8-729-046-97	TRANSISTOR	2SD1938 (F)-T (TX).SO		
Q409	8-729-421-19	TRANSISTOR	UN2213-TX		
Q410	8-729-421-19	TRANSISTOR	UN2213-TX		
Q501	8-729-424-18	TRANSISTOR	UN2113-TX (TW)		
Q502	8-729-808-42	TRANSISTOR	2SD1624-T-TD		
Q503	8-729-808-42	TRANSISTOR	2SD1624-T-TD		
Q504	8-729-421-22	TRANSISTOR	UN2211-TX		
Q505	8-729-421-22	TRANSISTOR	UN2211-TX (TW)		
		< RESISTOR >			
R101	1-216-073-00	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R103	1-216-089-91	RES-CHIP	47K	5%	1/10W
R104	1-216-089-91	RES-CHIP	47K	5%	1/10W
R105	1-216-089-91	RES-CHIP	47K	5%	1/10W
R106	1-216-089-91	RES-CHIP	47K	5%	1/10W
R107	1-216-089-91	RES-CHIP	47K	5%	1/10W
R108	1-216-089-91	RES-CHIP	47K	5%	1/10W
R109	1-216-073-00	METAL CHIP	10K	5%	1/10W
R110	1-216-021-00	METAL CHIP	68	5%	1/10W
R111	1-216-021-00	METAL CHIP	68	5%	1/10W
R112	1-216-021-00	METAL CHIP	68	5%	1/10W
R113	1-216-073-00	METAL CHIP	10K	5%	1/10W
R115	1-216-021-00	METAL CHIP	68	5%	1/10W
R116	1-216-021-00	METAL CHIP	68	5%	1/10W
R117	1-216-021-00	METAL CHIP	68	5%	1/10W
R118	1-216-021-00	METAL CHIP	68	5%	1/10W
R119	1-216-021-00	METAL CHIP	68	5%	1/10W
R120	1-216-021-00	METAL CHIP	68	5%	1/10W
R130	1-216-296-91	SHORT	0		
R201	1-216-295-91	SHORT	0		
R202	1-216-295-91	SHORT	0		
R203	1-216-295-91	SHORT	0		
R204	1-216-295-91	SHORT	0		
R205	1-216-295-91	SHORT	0		
R206	1-216-295-91	SHORT	0		
R207	1-216-295-91	SHORT	0		
R208	1-216-295-91	SHORT	0		
R209	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R210	1-216-033-00	METAL CHIP	220	5%	1/10W
R214	1-216-295-91	SHORT	0		
R215	1-216-295-91	SHORT	0		
R216	1-216-295-91	SHORT	0		
R217	1-216-295-91	SHORT	0		
R218	1-216-295-91	SHORT	0		
R219	1-216-295-91	SHORT	0		
R220	1-216-295-91	SHORT	0		
R221	1-216-295-91	SHORT	0		
R223	1-216-025-91	RES-CHIP	100	5%	1/10W
R224	1-216-295-91	SHORT	0		
R225	1-216-033-00	METAL CHIP	220	5%	1/10W
R226	1-216-033-00	METAL CHIP	220	5%	1/10W
R227	1-216-295-91	SHORT	0		
R228	1-216-295-91	SHORT	0		
R229	1-216-295-91	SHORT	0		
R230	1-216-295-91	SHORT	0		
R231	1-216-025-91	RES-CHIP	100	5%	1/10W
R235	1-216-001-00	METAL CHIP	10	5%	1/10W
R236	1-216-295-91	SHORT	0		
R239	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R240	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R241	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R242	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R244	1-216-073-00	METAL CHIP	10K	5%	1/10W
R245	1-216-073-00	METAL CHIP	10K	5%	1/10W
R246	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R247	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R248	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R249	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R250	1-216-053-00	METAL CHIP	1.5K	5%	1/10W

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

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Ref. No.	Part No.	Description			Remark
R251	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R252	1-216-073-00	METAL CHIP	10K	5%	1/10W
R253	1-216-073-00	METAL CHIP	10K	5%	1/10W
R254	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R255	1-216-049-91	RES-CHIP	1K	5%	1/10W
R256	1-216-049-91	RES-CHIP	1K	5%	1/10W
R257	1-216-073-00	METAL CHIP	10K	5%	1/10W
R258	1-216-097-91	RES-CHIP	100K	5%	1/10W
R259	1-216-025-91	RES-CHIP	100	5%	1/10W
R260	1-216-049-91	RES-CHIP	1K	5%	1/10W
R261	1-216-105-91	RES-CHIP	220K	5%	1/10W
R262	1-216-105-91	RES-CHIP	220K	5%	1/10W
R263	1-216-073-00	METAL CHIP	10K	5%	1/10W
R264	1-216-049-91	RES-CHIP	1K	5%	1/10W
R265	1-216-025-91	RES-CHIP	100	5%	1/10W
R266	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R267	1-216-049-91	RES-CHIP	1K	5%	1/10W
R268	1-216-073-00	METAL CHIP	10K	5%	1/10W
R269	1-216-049-91	RES-CHIP	1K	5%	1/10W
R270	1-216-073-00	METAL CHIP	10K	5%	1/10W
R271	1-216-033-00	METAL CHIP	220	5%	1/10W
R272	1-216-033-00	METAL CHIP	220	5%	1/10W
R273	1-216-105-91	RES-CHIP	220K	5%	1/10W
R274	1-216-105-91	RES-CHIP	220K	5%	1/10W
R275	1-216-049-91	RES-CHIP	1K	5%	1/10W
R276	1-216-049-91	RES-CHIP	1K	5%	1/10W
R277	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R278	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R279	1-216-073-00	METAL CHIP	10K	5%	1/10W
R280	1-216-073-00	METAL CHIP	10K	5%	1/10W
R281	1-216-073-00	METAL CHIP	10K	5%	1/10W
R282	1-216-073-00	METAL CHIP	10K	5%	1/10W
R283	1-216-073-00	METAL CHIP	10K	5%	1/10W
R284	1-216-073-00	METAL CHIP	10K	5%	1/10W
R285	1-216-295-91	SHORT	0		
R286	1-216-295-91	SHORT	0		
R287	1-216-073-00	METAL CHIP	10K	5%	1/10W
R288	1-216-073-00	METAL CHIP	10K	5%	1/10W
R289	1-216-097-91	RES-CHIP	100K	5%	1/10W
R290	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R291	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R292	1-216-073-00	METAL CHIP	10K	5%	1/10W
R294	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R296	1-216-073-00	METAL CHIP	10K	5%	1/10W
R297	1-216-075-00	METAL CHIP	12K	5%	1/10W
R298	1-216-041-00	METAL CHIP	470	5%	1/10W
R299	1-216-041-00	METAL CHIP	470	5%	1/10W
R300	1-216-295-91	SHORT	0		
R301	1-216-089-91	RES-CHIP	47K	5%	1/10W
R302	1-216-089-91	RES-CHIP	47K	5%	1/10W
R303	1-216-295-91	SHORT	0		
R304	1-216-085-00	METAL CHIP	33K	5%	1/10W
R305	1-216-075-00	METAL CHIP	12K	5%	1/10W
R306	1-216-033-00	METAL CHIP	220	5%	1/10W
R308	1-216-089-91	RES-CHIP	47K	5%	1/10W
R309	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R310	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R311	1-216-073-00	METAL CHIP	10K	5%	1/10W
R312	1-216-097-91	RES-CHIP	100K	5%	1/10W
R313	1-216-041-00	METAL CHIP	470	5%	1/10W
R314	1-216-049-91	RES-CHIP	1K	5%	1/10W
R315	1-216-049-91	RES-CHIP	1K	5%	1/10W
R316	1-216-049-91	RES-CHIP	1K	5%	1/10W
R320	1-216-025-91	RES-CHIP	100	5%	1/10W
R321	1-216-295-91	SHORT	0		
R322	1-216-021-00	METAL CHIP	68	5%	1/10W
R324	1-216-041-00	METAL CHIP	470	5%	1/10W
R325	1-216-041-00	METAL CHIP	470	5%	1/10W
R326	1-216-041-00	METAL CHIP	470	5%	1/10W
R327	1-216-041-00	METAL CHIP	470	5%	1/10W
R328	1-216-033-00	METAL CHIP	220	5%	1/10W
R329	1-414-766-22	INDUCTOR CHIP	0uH		
R330	1-216-295-91	SHORT	0		
R331	1-216-295-91	SHORT	0		
R332	1-216-295-91	SHORT	0		
R333	1-216-295-91	SHORT	0		
R334	1-216-295-91	SHORT	0		
R335	1-216-295-91	SHORT	0		
R336	1-216-097-91	RES-CHIP	100K	5%	1/10W
R337	1-216-097-91	RES-CHIP	100K	5%	1/10W
R401	1-216-025-91	RES-CHIP	100	5%	1/10W
R402	1-216-025-91	RES-CHIP	100	5%	1/10W
R403	1-216-295-91	SHORT	0		
R404	1-216-097-91	RES-CHIP	100K	5%	1/10W
R406	1-216-073-00	METAL CHIP	10K	5%	1/10W
R407	1-216-033-00	METAL CHIP	220	5%	1/10W
R408	1-216-295-91	SHORT	0		
R409	1-216-097-91	RES-CHIP	100K	5%	1/10W
R411	1-216-073-00	METAL CHIP	10K	5%	1/10W
R412	1-216-033-00	METAL CHIP	220	5%	1/10W
R413	1-216-047-91	RES-CHIP	820	5%	1/10W
R414	1-216-097-91	RES-CHIP	100K	5%	1/10W
R416	1-216-083-00	METAL CHIP	27K	5%	1/10W
R418	1-216-073-00	METAL CHIP	10K	5%	1/10W
R419	1-216-097-91	RES-CHIP	100K	5%	1/10W
R420	1-216-041-00	METAL CHIP	470	5%	1/10W
R421	1-216-073-00	METAL CHIP	10K	5%	1/10W
R422	1-216-049-91	RES-CHIP	1K	5%	1/10W
R423	1-216-049-91	RES-CHIP	1K	5%	1/10W
R425	1-216-033-00	METAL CHIP	220	5%	1/10W
R426	1-216-033-00	METAL CHIP	220	5%	1/10W
R427	1-216-073-00	METAL CHIP	10K	5%	1/10W
R428	1-216-295-91	SHORT	0		
R429	1-216-295-91	SHORT	0		
R430	1-216-073-00	METAL CHIP	10K	5%	1/10W
R431	1-216-047-91	RES-CHIP	820	5%	1/10W (HK, SP, CH)
R431	1-216-061-00	METAL CHIP	3.3K	5%	1/10W (TW)
R433	1-216-075-00	METAL CHIP	12K	5%	1/10W
R434	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R435	1-216-073-00	METAL CHIP	10K	5%	1/10W
R436	1-216-025-91	RES-CHIP	100	5%	1/10W
R437	1-216-033-00	METAL CHIP	220	5%	1/10W
R439	1-216-073-00	METAL CHIP	10K	5%	1/10W
R440	1-216-073-00	METAL CHIP	10K	5%	1/10W
R441	1-216-001-00	METAL CHIP	10	5%	1/10W
R442	1-216-073-00	METAL CHIP	10K	5%	1/10W
R443	1-216-089-91	RES-CHIP	47K	5%	1/10W
R444	1-216-025-91	RES-CHIP	100	5%	1/10W

Ref. No.	Part No.	Description			Remark
R445	1-216-025-91	RES-CHIP	100	5%	1/10W
R446	1-216-025-91	RES-CHIP	100	5%	1/10W
R447	1-216-025-91	RES-CHIP	100	5%	1/10W
R448	1-216-025-91	RES-CHIP	100	5%	1/10W
R449	1-216-025-91	RES-CHIP	100	5%	1/10W
R450	1-216-097-91	RES-CHIP	100K	5%	1/10W
R451	1-216-033-00	METAL CHIP	220	5%	1/10W
R452	1-216-049-91	RES-CHIP	1K	5%	1/10W
R454	1-216-043-91	RES-CHIP	560	5%	1/10W
R455	1-216-073-00	METAL CHIP	10K	5%	1/10W
R456	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R457	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R458	1-216-093-91	RES-CHIP	68K	5%	1/10W
R459	1-216-001-00	METAL CHIP	10	5%	1/10W
R460	1-216-025-91	RES-CHIP	100	5%	1/10W
R461	1-216-025-91	RES-CHIP	100	5%	1/10W
R462	1-216-025-91	RES-CHIP	100	5%	1/10W
R463	1-216-025-91	RES-CHIP	100	5%	1/10W
R464	1-216-049-91	RES-CHIP	1K	5%	1/10W
R465	1-216-001-00	METAL CHIP	10	5%	1/10W
R466	1-216-073-00	METAL CHIP	10K	5%	1/10W
R501	1-216-073-00	METAL CHIP	10K	5%	1/10W
R502	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R503	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R504	1-216-295-91	SHORT	0		
R505	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R508	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R510	1-216-081-00	METAL CHIP	22K	5%	1/10W
R511	1-216-081-00	METAL CHIP	22K	5%	1/10W
R512	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R513	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R514	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R515	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R517	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R518	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R519	1-216-295-91	SHORT	0 (HK, SP, CH)		
R520	1-216-295-91	SHORT	0 (TW)		
R521	1-216-073-00	METAL CHIP	10K	5%	1/10W
R522	1-216-073-00	METAL CHIP	10K	5%	1/10W
R523	1-216-013-00	METAL CHIP	33	5%	1/10W
R524	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R525	1-216-027-00	METAL CHIP	120	5%	1/10W
R526	1-216-295-91	SHORT	0		
R527	1-216-025-91	RES-CHIP	100	5%	1/10W
R528	1-216-025-91	RES-CHIP	100	5%	1/10W
R529	1-216-049-91	RES-CHIP	1K	5%	1/10W (HK, SP, CH)
R529	1-216-295-91	SHORT	0 (TW)		
R530	1-216-041-00	METAL CHIP	470	5%	1/10W (HK, SP, CH)
R531	1-216-073-00	METAL CHIP	10K	5%	1/10W
R532	1-216-295-91	SHORT	0		
R533	1-216-073-00	METAL CHIP	10K	5%	1/10W
R534	1-216-015-00	METAL CHIP	39	5%	1/10W
R536	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R537	1-216-025-91	RES-CHIP	100	5%	1/10W
R538	1-216-097-91	RES-CHIP	100K	5%	1/10W
R539	1-216-295-91	SHORT	0		
R540	1-216-073-00	METAL CHIP	10K	5%	1/10W
R541	1-216-073-00	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R542	1-216-073-00	METAL CHIP	10K	5%	1/10W
R547	1-216-073-00	METAL CHIP	10K	5%	1/10W
R548	1-216-073-00	METAL CHIP	10K	5%	1/10W
R549	1-216-073-00	METAL CHIP	10K	5%	1/10W
R550	1-216-073-00	METAL CHIP	10K	5%	1/10W
R552	1-216-073-00	METAL CHIP	10K	5%	1/10W
R553	1-216-025-91	RES-CHIP	100	5%	1/10W
R555	1-216-025-91	RES-CHIP	100	5%	1/10W
R556	1-216-073-00	METAL CHIP	10K	5%	1/10W
R558	1-216-037-00	METAL CHIP	330	5%	1/10W
R559	1-216-033-00	METAL CHIP	220	5%	1/10W
R561	1-216-073-00	METAL CHIP	10K	5%	1/10W
R562	1-216-073-00	METAL CHIP	10K	5%	1/10W
R564	1-216-073-00	METAL CHIP	10K	5%	1/10W
R565	1-216-093-91	RES-CHIP	68K	5%	1/10W
R566	1-216-093-91	RES-CHIP	68K	5%	1/10W
R567	1-216-295-91	SHORT	0		
R568	1-216-025-91	RES-CHIP	100	5%	1/10W
R569	1-216-025-91	RES-CHIP	100	5%	1/10W
R570	1-216-025-91	RES-CHIP	100	5%	1/10W
R571	1-216-025-91	RES-CHIP	100	5%	1/10W
R572	1-216-025-91	RES-CHIP	100	5%	1/10W
R573	1-216-025-91	RES-CHIP	100	5%	1/10W
R574	1-216-093-91	RES-CHIP	68K	5%	1/10W
R575	1-216-093-91	RES-CHIP	68K	5%	1/10W
R576	1-216-093-91	RES-CHIP	68K	5%	1/10W
R577	1-216-093-91	RES-CHIP	68K	5%	1/10W
R578	1-216-295-91	SHORT	0		
R579	1-216-295-91	SHORT	0 (HK, SP, CH)		
R580	1-216-295-91	SHORT	0 (HK, SP, CH)		
R581	1-216-295-91	SHORT	0		
R582	1-216-295-91	SHORT	0		
		< SWITCH >			
S501	1-771-574-21	SWITCH, TACTILE (RESERVE)			
S502	1-771-574-21	SWITCH, TACTILE (PREV ⏮)			
S503	1-771-574-21	SWITCH, TACTILE (RETURN)			
S504	1-771-574-21	SWITCH, TACTILE (NEXT ⏭)			
S505	1-771-574-21	SWITCH, TACTILE (DISPLAY)			
S506	1-771-574-21	SWITCH, TACTILE (DVD MENU)			
S507	1-771-574-21	SWITCH, TACTILE (❚❚)			
S508	1-771-574-21	SWITCH, TACTILE (TITLE)			
S509	1-771-574-21	SWITCH, TACTILE (■)			
S510	1-771-574-21	SWITCH, TACTILE (▷)			
S511	1-771-574-21	SWITCH, TACTILE (OPEN/CLOSE ⏏)			
		< TRANSFORMER >			
T501	1-435-411-11	TRANSFORMER, DC-DC CONVERTER			
		< VIBRATOR >			
X501	1-781-853-21	VIBRATOR, CERAMIC (2MHz)			

MB-86

Ref. No.	Part No.	Description				Remark
*	A-6065-546-A	MB-86 BOARD, COMPLETE (HK, SP)				
*	A-6065-559-A	MB-86 BOARD, COMPLETE (CH)				
*	A-6065-563-A	MB-86 BOARD, COMPLETE (TW)				
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		(Ref. No. 1,000 Series)				
		< CAPACITOR >				
C101	1-162-919-11	CERAMIC CHIP	22PF	5%	50V	
C102	1-162-919-11	CERAMIC CHIP	22PF	5%	50V	
C103	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C104	1-126-209-11	ELECT CHIP	100uF	20%	4V	
C105	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C106	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C107	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C108	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C109	1-162-916-11	CERAMIC CHIP	12PF	5%	50V	
C110	1-162-916-11	CERAMIC CHIP	12PF	5%	50V	
C111	1-126-209-11	ELECT CHIP	100uF	20%	4V	
C112	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V	
C114	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C115	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C116	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C117	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C118	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C119	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C120	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C201	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C202	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V	
C203	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V	
C204	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V	
C205	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V	
C206	1-124-779-00	ELECT CHIP	10uF	20%	16V	
C207	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C208	1-162-919-11	CERAMIC CHIP	22PF	5%	50V	
C209	1-162-919-11	CERAMIC CHIP	22PF	5%	50V	
C210	1-162-919-11	CERAMIC CHIP	22PF	5%	50V	
C211	1-162-919-11	CERAMIC CHIP	22PF	5%	50V	
C212	1-124-779-00	ELECT CHIP	10uF	20%	16V	
C213	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C214	1-164-172-11	CERAMIC CHIP	0.0056uF	10%	25V	
C215	1-164-739-11	CERAMIC CHIP	560PF	5%	50V	
C216	1-164-172-11	CERAMIC CHIP	0.0056uF	10%	25V	
C217	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C218	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C219	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C221	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	
C222	1-164-730-11	CERAMIC CHIP	0.0012uF	10%	50V	
C223	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	
C224	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C225	1-164-217-11	CERAMIC CHIP	150PF	5%	50V	
C226	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C227	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V	
C228	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C229	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C230	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C231	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C232	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C233	1-124-779-00	ELECT CHIP	10uF	20%	16V	
C234	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C235	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	
C236	1-164-739-11	CERAMIC CHIP	560PF	5%	50V	
C237	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C238	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C239	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C301	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V	
C302	1-126-209-11	ELECT CHIP	100uF	20%	4V	
C303	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C304	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C305	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	
C306	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C307	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C308	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C309	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C310	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C311	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C312	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C313	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C314	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C315	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C316	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C317	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C318	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C319	1-126-206-11	ELECT CHIP	100uF	20%	6.3V	
C320	1-126-206-11	ELECT CHIP	100uF	20%	6.3V	
C321	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C322	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C324	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C325	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C326	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C327	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C328	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C329	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C330	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C331	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
C332	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C401	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C405	1-126-204-11	ELECT CHIP	47uF	20%	16V	
C407	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C408	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C409	1-164-315-11	CERAMIC CHIP	470PF	5%	50V	
C410	1-162-921-11	CERAMIC CHIP	33PF	5%	50V	
C411	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C412	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V	
C413	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C414	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C415	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C416	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C417	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V	
C418	1-162-921-11	CERAMIC CHIP	33PF	5%	50V	
C419	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V	
C420	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V	
C421	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
C422	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
C423	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	
C424	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
C425	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V	
C426	1-164-315-11	CERAMIC CHIP	470PF	5%	50V	
C427	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V	
C428	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	
C429	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	
C430	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	

Ref. No.	Part No.	Description			Remark
C431	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C433	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C434	1-164-315-11	CERAMIC CHIP	470PF	5%	50V
C435	1-164-315-11	CERAMIC CHIP	470PF	5%	50V
C436	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C437	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C438	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C439	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C440	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C441	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C442	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C443	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C444	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C445	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C446	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C447	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C448	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C449	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C450	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C451	1-126-204-11	ELECT CHIP	47uF	20%	16V
C452	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C453	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C454	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C455	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C456	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C457	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C458	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C459	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C460	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C462	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C463	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C465	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C466	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C501	1-124-779-00	ELECT CHIP	10uF	20%	16V
C502	1-124-779-00	ELECT CHIP	10uF	20%	16V
C503	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C504	1-124-779-00	ELECT CHIP	10uF	20%	16V
C505	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C506	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C507	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C508	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C509	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C510	1-124-779-00	ELECT CHIP	10uF	20%	16V
C511	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C512	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C513	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C514	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C515	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C516	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C517	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C518	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C519	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C520	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C521	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C522	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C523	1-126-246-11	ELECT CHIP	220uF	20%	4V
C524	1-126-204-11	ELECT CHIP	47uF	20%	16V

Ref. No.	Part No.	Description			Remark
C525	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C528	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C529	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C530	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C531	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C532	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C533	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C534	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C535	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C536	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C537	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C538	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C539	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C540	1-126-193-11	ELECT	1uF	20%	50V
C541	1-124-779-00	ELECT CHIP	10uF	20%	16V
C542	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
		< CONNECTOR >			
* CN102	1-764-250-11	PIN, CONNECTOR (PC BOARD) 4P			
CN201	1-764-530-21	CONNECTOR, FFC/FPC (ZIF) 23P			
CN202	1-566-529-11	CONNECTOR, FPC (ZIF) 13P			
CN401	1-794-234-11	CONNECTOR, FFC/FPC 6P			
CN402	1-779-993-11	PIN, CONNECTOR (PWB) 5P			
CN501	1-794-324-11	CONNECTOR, BOARD TO BOARD 34P			
CN701	1-794-324-11	CONNECTOR, BOARD TO BOARD 34P			
		< DIODE >			
D101	8-719-071-34	DIODE RB521S-30-TE61			
D201	8-719-988-61	DIODE 1SS355TE-17			
		< FUSE >			
⚠F401	1-533-771-21	FUSE (SMD) (0.8A)			
⚠F402	1-533-771-21	FUSE (SMD) (0.8A)			
		< FERRITE BEAD >			
FB102	1-414-226-21	INDUCTOR CHIP	0uH		
FB104	1-414-226-21	INDUCTOR CHIP	0uH		
FB105	1-414-226-21	INDUCTOR CHIP	0uH		
FB107	1-414-226-21	INDUCTOR CHIP	0uH		
FB108	1-414-226-21	INDUCTOR CHIP	0uH		
FB109	1-414-226-21	INDUCTOR CHIP	0uH		
FB110	1-414-226-21	INDUCTOR CHIP	0uH		
FB501	1-469-324-21	FERRITE	0uH		
FB502	1-469-324-21	FERRITE	0uH		
FB503	1-469-324-21	FERRITE	0uH		
FB504	1-469-324-21	FERRITE	0uH		
FB505	1-469-324-21	FERRITE	0uH		
FB506	1-469-324-21	FERRITE	0uH		
FB507	1-469-324-21	FERRITE	0uH		
FB508	1-216-797-11	METAL CHIP	10	5%	1/16W
		< FILTER >			
FL101	1-234-177-21	FILTER, CHIP EMI			
FL102	1-234-177-21	FILTER, CHIP EMI			
FL103	1-234-177-21	FILTER, CHIP EMI			
FL201	1-234-177-21	FILTER, CHIP EMI			
FL301	1-234-177-21	FILTER, CHIP EMI			

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

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Ref. No.	Part No.	Description				Remark
FL302	1-234-177-21	FILTER, CHIP EMI				
FL303	1-234-177-21	FILTER, CHIP EMI				
FL402	1-234-177-21	FILTER, CHIP EMI				
FL501	1-234-177-21	FILTER, CHIP EMI				
FL502	1-234-177-21	FILTER, CHIP EMI				
FL503	1-234-177-21	FILTER, CHIP EMI				
FL504	1-234-177-21	FILTER, CHIP EMI				
FL505	1-234-177-21	FILTER, CHIP EMI				
FL506	1-234-177-21	FILTER, CHIP EMI				
FL507	1-233-893-21	FILTER, CHIP EMI				
FL508	1-234-177-21	FILTER, CHIP EMI				
		< IC >				
IC101	8-759-667-20	IC BR9080F-E2				
IC102	8-759-663-92	IC MB91107PFV-G-BND				
IC103	8-759-427-92	IC PST9126NL				
IC104	8-759-594-13	IC MBM29DL324BD-90PFTN				
IC105	8-759-667-86	IC CXD9572N-E2				
IC201	8-759-567-24	IC SSI33P3722				
IC301	8-759-486-55	IC NJM2370U33-TE2				
IC302	8-759-666-84	IC CXD9576R				
IC303	8-759-643-10	IC GM71V18160CT-6TR				
IC401	8-759-660-88	IC LA6553-TE-L				
IC402	8-759-660-88	IC LA6553-TE-L				
IC403	8-759-338-78	IC BA10324AFV-E2				
IC404	8-759-660-87	IC CXD9569R				
IC502	8-752-399-55	IC CXD1932Q				
IC503	8-759-486-55	IC NJM2370U33-TE2				
IC504	8-759-573-19	IC MT48LC1M16A1TG-7S				
IC505	8-759-573-19	IC MT48LC1M16A1TG-7S				
IC506	8-759-669-28	IC PQ1R18				
		< COIL >				
L201	1-412-031-11	INDUCTOR CHIP	47uH			
		< TRANSISTOR >				
Q201	8-729-820-86	TRANSISTOR	2SB1121-T-TD			
Q203	8-729-402-42	TRANSISTOR	UN5213-TX			
		< RESISTOR >				
R002	1-216-801-11	METAL CHIP	22	5%	1/16W	
R009	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R012	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R013	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R014	1-216-805-11	METAL CHIP	47	5%	1/16W	
R015	1-216-809-11	METAL CHIP	100	5%	1/16W	
R016	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R017	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R019	1-216-817-11	METAL CHIP	470	5%	1/16W	
R020	1-216-295-91	SHORT	0			
R021	1-216-296-91	SHORT	0			
R041	1-216-797-11	METAL CHIP	10	5%	1/16W	
R042	1-216-797-11	METAL CHIP	10	5%	1/16W	
R101	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R102	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R104	1-216-801-11	METAL CHIP	22	5%	1/16W	
R105	1-216-797-11	METAL CHIP	10	5%	1/16W	
R114	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R118	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R120	1-216-833-91	RES-CHIP	10K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R121	1-216-864-11	METAL CHIP	0	5%	1/16W	
R123	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R124	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
						(HK, SP, TW)
R124	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
						(CH)
R125	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R126	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R127	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R128	1-216-081-00	METAL CHIP	22K	5%	1/10W	
						(HK, SP, TW)
R128	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	
						(CH)
R129	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R130	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R131	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R136	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R138	1-216-797-11	METAL CHIP	10	5%	1/16W	
R139	1-216-797-11	METAL CHIP	10	5%	1/16W	
R140	1-216-797-11	METAL CHIP	10	5%	1/16W	
R154	1-216-864-11	METAL CHIP	0	5%	1/16W	
R158	1-216-797-11	METAL CHIP	10	5%	1/16W	
R159	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R161	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R164	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R166	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R167	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R168	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R169	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R170	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R171	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R172	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R173	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R174	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R175	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R176	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R183	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R184	1-216-801-11	METAL CHIP	22	5%	1/16W	
R186	1-216-864-11	METAL CHIP	0	5%	1/16W	
R187	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R188	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R190	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R191	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R195	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R201	1-216-815-11	METAL CHIP	330	5%	1/16W	
R202	1-216-809-11	METAL CHIP	100	5%	1/16W	
R203	1-216-809-11	METAL CHIP	100	5%	1/16W	
R204	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R206	1-216-803-11	METAL CHIP	33	5%	1/16W	
R207	1-216-803-11	METAL CHIP	33	5%	1/16W	
R208	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R209	1-216-797-11	METAL CHIP	10	5%	1/16W	
R210	1-216-820-11	METAL CHIP	820	5%	1/16W	
R211	1-216-811-11	METAL CHIP	150	5%	1/16W	
R214	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R215	1-216-813-11	METAL CHIP	220	5%	1/16W	
R217	1-216-861-11	METAL CHIP	2.2K	5%	1/16W	
R222	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R223	1-216-833-91	RES-CHIP	10K	5%	1/16W	
R224	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	

Ref. No.	Part No.	Description			Remark
R225	1-216-833-91	RES-CHIP	10K	5%	1/16W
R301	1-218-879-11	METAL CHIP	22K	0.5%	1/16W
R302	1-218-831-11	METAL CHIP	220	0.5%	1/16W
R303	1-218-883-11	METAL CHIP	33K	0.5%	1/16W
R304	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R305	1-216-838-11	METAL CHIP	27K	5%	1/16W
R306	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R307	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R309	1-216-809-11	METAL CHIP	100	5%	1/16W
R310	1-216-833-91	RES-CHIP	10K	5%	1/16W
R311	1-216-845-11	METAL CHIP	100K	5%	1/16W
R313	1-218-855-11	METAL CHIP	2.2K	0.5%	1/16W
R314	1-218-847-11	METAL CHIP	1K	0.5%	1/16W
R315	1-218-871-11	METAL CHIP	10K	0.5%	1/16W
R316	1-218-871-11	METAL CHIP	10K	0.5%	1/16W
R317	1-216-833-91	RES-CHIP	10K	5%	1/16W
R318	1-216-833-91	RES-CHIP	10K	5%	1/16W
R319	1-218-853-11	METAL CHIP	1.8K	0.5%	1/16W
R320	1-216-833-91	RES-CHIP	10K	5%	1/16W
R321	1-216-813-11	METAL CHIP	220	5%	1/16W
R327	1-216-809-11	METAL CHIP	100	5%	1/16W
R338	1-216-801-11	METAL CHIP	22	5%	1/16W
R401	1-216-833-91	RES-CHIP	10K	5%	1/16W
R402	1-216-833-91	RES-CHIP	10K	5%	1/16W
R403	1-216-833-91	RES-CHIP	10K	5%	1/16W
R404	1-216-821-11	METAL CHIP	1K	5%	1/16W
R405	1-216-821-11	METAL CHIP	1K	5%	1/16W
R406	1-216-821-11	METAL CHIP	1K	5%	1/16W
R407	1-216-797-11	METAL CHIP	10	5%	1/16W
R408	1-216-311-00	METAL CHIP	6.8	5%	1/10W
R409	1-216-797-11	METAL CHIP	10	5%	1/16W
R411	1-216-835-11	METAL CHIP	15K	5%	1/16W
R412	1-216-797-11	METAL CHIP	10	5%	1/16W
R415	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R416	1-216-847-11	METAL CHIP	150K	5%	1/16W
R417	1-216-843-11	METAL CHIP	68K	5%	1/16W
R418	1-216-847-11	METAL CHIP	150K	5%	1/16W
R419	1-216-835-11	METAL CHIP	15K	5%	1/16W
R420	1-216-835-11	METAL CHIP	15K	5%	1/16W
R421	1-216-836-11	METAL CHIP	18K	5%	1/16W
R422	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R423	1-216-833-91	RES-CHIP	10K	5%	1/16W
R424	1-216-844-11	METAL CHIP	82K	5%	1/16W
R425	1-216-845-11	METAL CHIP	100K	5%	1/16W
R426	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R427	1-216-835-11	METAL CHIP	15K	5%	1/16W
R428	1-216-841-11	METAL CHIP	47K	5%	1/16W
R429	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R436	1-216-833-91	RES-CHIP	10K	5%	1/16W
R443	1-216-844-11	METAL CHIP	82K	5%	1/16W
R444	1-216-843-11	METAL CHIP	68K	5%	1/16W
R445	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R446	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R447	1-216-835-11	METAL CHIP	15K	5%	1/16W
R448	1-216-835-11	METAL CHIP	15K	5%	1/16W
R449	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R450	1-216-833-91	RES-CHIP	10K	5%	1/16W
R451	1-216-821-11	METAL CHIP	1K	5%	1/16W
R452	1-216-797-11	METAL CHIP	10	5%	1/16W
R454	1-216-311-00	METAL CHIP	6.8	5%	1/10W

Ref. No.	Part No.	Description			Remark
R458	1-216-833-91	RES-CHIP	10K	5%	1/16W
R459	1-216-833-91	RES-CHIP	10K	5%	1/16W
R460	1-216-845-11	METAL CHIP	100K	5%	1/16W
R463	1-216-821-11	METAL CHIP	1K	5%	1/16W
R464	1-218-899-11	METAL CHIP	150K	0.5%	1/16W
R465	1-216-821-11	METAL CHIP	1K	5%	1/16W
R466	1-216-821-11	METAL CHIP	1K	5%	1/16W
R467	1-216-821-11	METAL CHIP	1K	5%	1/16W
R468	1-216-821-11	METAL CHIP	1K	5%	1/16W
R469	1-218-889-11	METAL CHIP	56K	0.5%	1/16W
R470	1-218-850-11	METAL CHIP	1.3K	0.5%	1/16W
R471	1-218-899-11	METAL CHIP	150K	0.5%	1/16W
R472	1-218-847-11	METAL CHIP	1K	0.5%	1/16W
R473	1-218-850-11	METAL CHIP	1.3K	0.5%	1/16W
R474	1-218-889-11	METAL CHIP	56K	0.5%	1/16W
R475	1-216-797-11	METAL CHIP	10	5%	1/16W
R476	1-216-813-11	METAL CHIP	220	5%	1/16W
R477	1-216-821-11	METAL CHIP	1K	5%	1/16W
R478	1-216-836-11	METAL CHIP	18K	5%	1/16W
R479	1-216-836-11	METAL CHIP	18K	5%	1/16W
R480	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R481	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R482	1-216-803-11	METAL CHIP	33	5%	1/16W
R483	1-216-834-11	METAL CHIP	12K	5%	1/16W
R484	1-216-834-11	METAL CHIP	12K	5%	1/16W
R485	1-216-817-11	METAL CHIP	470	5%	1/16W
R486	1-218-847-11	METAL CHIP	1K	0.5%	1/16W
R487	1-218-847-11	METAL CHIP	1K	0.5%	1/16W
R488	1-218-847-11	METAL CHIP	1K	0.5%	1/16W
R489	1-218-847-11	METAL CHIP	1K	0.5%	1/16W
R490	1-216-817-11	METAL CHIP	470	5%	1/16W
R491	1-216-821-11	METAL CHIP	1K	5%	1/16W
R492	1-216-817-11	METAL CHIP	470	5%	1/16W
R493	1-216-817-11	METAL CHIP	470	5%	1/16W
R494	1-216-817-11	METAL CHIP	470	5%	1/16W
R495	1-216-797-11	METAL CHIP	10	5%	1/16W
R496	1-216-821-11	METAL CHIP	1K	5%	1/16W
R497	1-216-821-11	METAL CHIP	1K	5%	1/16W
R501	1-216-809-11	METAL CHIP	100	5%	1/16W
R502	1-216-833-91	RES-CHIP	10K	5%	1/16W
R503	1-218-831-11	METAL CHIP	220	0.5%	1/16W
R504	1-218-831-11	METAL CHIP	220	0.5%	1/16W
R505	1-218-831-11	METAL CHIP	220	0.5%	1/16W
R506	1-218-831-11	METAL CHIP	220	0.5%	1/16W
R507	1-218-831-11	METAL CHIP	220	0.5%	1/16W
R508	1-218-831-11	METAL CHIP	220	0.5%	1/16W
R509	1-216-864-11	METAL CHIP	0	5%	1/16W
R510	1-216-864-11	METAL CHIP	0	5%	1/16W
R517	1-216-833-91	RES-CHIP	10K	5%	1/16W
R518	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R521	1-216-864-11	METAL CHIP	0	5%	1/16W
R526	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R527	1-216-864-11	METAL CHIP	0	5%	1/16W
R529	1-216-833-91	RES-CHIP	10K	5%	1/16W
R530	1-216-833-91	RES-CHIP	10K	5%	1/16W
R535	1-216-864-11	METAL CHIP	0	5%	1/16W
R536	1-216-864-11	METAL CHIP	0	5%	1/16W
R540	1-216-864-11	METAL CHIP	0	5%	1/16W
R542	1-216-864-11	METAL CHIP	0	5%	1/16W
R701	1-216-864-11	METAL CHIP	0	5%	1/16W

Ref. No.	Part No.	Description			Remark
R750	1-216-864-11	METAL CHIP	0	5%	1/16W
R751	1-216-864-11	METAL CHIP	0	5%	1/16W
R752	1-216-864-11	METAL CHIP	0	5%	1/16W
R753	1-216-864-11	METAL CHIP	0	5%	1/16W
R754	1-216-864-11	METAL CHIP	0	5%	1/16W
R755	1-216-864-11	METAL CHIP	0	5%	1/16W
R771	1-216-864-11	METAL CHIP	0	5%	1/16W
R773	1-216-864-11	METAL CHIP	0	5%	1/16W
R782	1-216-864-11	METAL CHIP	0	5%	1/16W
R785	1-216-864-11	METAL CHIP	0	5%	1/16W
		< COMPOSITION CIRCUIT BLOCK >			
* RB101	1-233-270-11	NETWORK, RES (8 GANG) 10K			
* RB102	1-233-270-11	NETWORK, RES (8 GANG) 10K			
		< VARIABLE RESISTOR >			
RV501	1-223-583-11	RES, ADJ, CARBON 1K			
		< VIBRATOR >			
X101	1-781-185-21	VIBRATOR, CERAMIC (12.5MHz)			
X102	1-781-867-21	VIBRATOR, CRYSTAL (27MHz)			

Ref. No.	Part No.	Description			Remark
*	A-6065-544-A	MC-126 BOARD, COMPLETE (HK, SP, CH)			
*	A-6065-561-A	MC-126 BOARD, COMPLETE (TW)			
		************************			
		(Ref. No. 2,000 Series)			
		< CAPACITOR >			
C601	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C602	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C603	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C605	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C606	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C607	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C608	1-127-573-91	CERAMIC CHIP	1uF	10%	16V
C609	1-127-573-91	CERAMIC CHIP	1uF	10%	16V
C610	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C611	1-127-573-91	CERAMIC CHIP	1uF	10%	16V
C612	1-124-257-00	ELECT	2.2uF	20%	50V
C613	1-163-263-11	CERAMIC CHIP	330PF	5%	50V
C614	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C615	1-124-257-00	ELECT	2.2uF	20%	50V
C616	1-163-263-11	CERAMIC CHIP	330PF	5%	50V
C617	1-127-573-91	CERAMIC CHIP	1uF	10%	16V
C618	1-124-257-00	ELECT	2.2uF	20%	50V
C619	1-124-257-00	ELECT	2.2uF	20%	50V
C620	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C621	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C622	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C623	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C625	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C626	1-124-584-00	ELECT	100uF	20%	10V
C627	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C628	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C629	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C630	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
		< CONNECTOR >			
CN601	1-770-638-11	CONNECTOR, FFC/FPC 7P (TW)			
CN601	1-785-694-11	CONNECTOR, FFC/FPC 7P (HK, SP, CH)			
CN602	1-784-642-11	CONNECTOR, BOARD TO BOARD 11P			
		< EARTH TERMINAL >			
* ET601	1-537-738-21	TERMINAL, EARTH			
		< FERRITE BEAD >			
FB601	1-414-233-22	INDUCTOR CHIP	0uH		
FB602	1-414-233-22	INDUCTOR CHIP	0uH		
FB603	1-414-233-22	INDUCTOR CHIP	0uH		
FB604	1-414-233-22	INDUCTOR CHIP	0uH		
FB605	1-414-233-22	INDUCTOR CHIP	0uH		
FB606	1-414-233-22	INDUCTOR CHIP	0uH		
		< IC >			
IC601	8-759-369-74	IC NJM4556AM-TE2			
IC602	8-759-909-71	IC BA4558F-E2			
IC603	8-719-066-43	DIODE GP1U28Y			
		< JACK >			
J601	1-563-988-21	JACK, LARGE TYPE 2P (MIC1/MIC2)			
		< JUMPER RESISTOR >			
JR501	1-216-296-91	SHORT	0		
JR502	1-216-296-91	SHORT	0		
JR503	1-216-296-91	SHORT	0		
JR504	1-216-296-91	SHORT	0		
JR505	1-216-296-91	SHORT	0		
JR506	1-216-296-91	SHORT	0		
JR507	1-216-296-91	SHORT	0		
JR655	1-216-295-91	SHORT	0		
		< RESISTOR >			
R601	1-216-295-91	SHORT	0		
R604	1-216-295-91	SHORT	0		
R606	1-216-295-91	SHORT	0		
R609	1-216-295-91	SHORT	0		
R611	1-216-025-91	RES-CHIP	100	5%	1/10W
R612	1-216-025-91	RES-CHIP	100	5%	1/10W
R613	1-216-097-91	RES-CHIP	100K	5%	1/10W
R614	1-216-097-91	RES-CHIP	100K	5%	1/10W
R615	1-216-097-91	RES-CHIP	100K	5%	1/10W
R616	1-216-097-91	RES-CHIP	100K	5%	1/10W
R617	1-216-049-91	RES-CHIP	1K	5%	1/10W
R618	1-216-089-91	RES-CHIP	47K	5%	1/10W
R619	1-216-049-91	RES-CHIP	1K	5%	1/10W
R620	1-216-089-91	RES-CHIP	47K	5%	1/10W
R621	1-216-073-00	METAL CHIP	10K	5%	1/10W
R622	1-216-073-00	METAL CHIP	10K	5%	1/10W
R623	1-216-025-91	RES-CHIP	100	5%	1/10W
R624	1-216-025-91	RES-CHIP	100	5%	1/10W
R625	1-216-049-91	RES-CHIP	1K	5%	1/10W
R626	1-216-073-00	METAL CHIP	10K	5%	1/10W
R627	1-216-073-00	METAL CHIP	10K	5%	1/10W
R628	1-216-073-00	METAL CHIP	10K	5%	1/10W
R630	1-216-295-91	SHORT	0		
R631	1-216-295-91	SHORT	0		
R632	1-216-295-91	SHORT	0		
R634	1-216-017-91	RES-CHIP	47	5%	1/10W

Ref. No.	Part No.	Description			Remark
R635	1-216-089-91	RES-CHIP	47K	5%	1/10W
R636	1-216-101-00	METAL CHIP	150K	5%	1/10W

Ref. No.	Part No.	Description	Remark
*	A-6066-016-A	MS-48 BOARD, COMPLETE	
		**********************	
		(Ref. No. 2,000 Series)	
		< CONNECTOR >	
CN001	1-794-197-11	CONNECTOR, FFC/FPC 6P	
		< SWITCH >	
S001	1-771-562-11	SWITCH, LEVER (CHUCK SENSOR)	
S002	1-762-386-11	SWITCH, PUSH (TRAY SENSOR)	

Ref. No.	Part No.	Description		Remark
*	1-468-506-31	POWER BLOCK (HS16S9E) (HK, SP, CH)		
		**********************		
		(Ref.No. 4,000 Series)		
		< CAPACITOR >		
C211	1-107-895-11	ELECT	330uF	35V
C213	1-126-947-11	ELECT	47uF	35V
C301	1-126-960-11	ELECT	1uF	50V
C311	1-107-895-11	ELECT	330uF	35V
C313	1-126-947-11	ELECT	47uF	35V
C315	1-126-947-11	ELECT	47uF	35V
C511	1-107-911-11	ELECT	220uF	35V
C513	1-126-947-11	ELECT	47uF	35V
C611	1-107-895-11	ELECT	330uF	35V
C613	1-126-948-11	ELECT	100uF	35V
		< DIODE >		
D101	9-885-000-79	DIODE S1WBA60		
D102	8-719-160-78	DIODE RD24FB2		
D104	8-719-983-00	DIODE MTZJ-T-77-2.4B		
D105	8-719-991-33	DIODE 1SS133T-77		
D211	8-719-027-43	DIODE S2L20U		
D212	8-719-160-87	DIODE RD33FB2		
D311	8-719-018-83	DIODE D2S4M		
D315	8-719-991-33	DIODE 1SS133T-77		
D511	8-719-027-43	DIODE S2L20U		
D611	8-719-500-50	DIODE D3S4M		
D613	8-719-991-33	DIODE 1SS133T-77		
D615	8-719-064-11	DIODE SPR-325MVW (ON/STANDBY)		
		< FUSE >		
⚠F101	1-532-388-31	FUSE (T2AL/250V)		
		< IC >		
IC301	8-759-420-19	IC AN1431T		
		< IC LINK >		
⚠P611	1-533-593-11	LINK, IC (2A)		
⚠P612	1-533-593-11	LINK, IC (2A)		
		< PHOTO COUPLER >		
⚠PC101	8-749-011-50	PHOTO COUPLER PS2561L1-1-V-Q		
		< TRANSISTOR >		
Q102	8-729-024-00	TRANSISTOR 2SC3377		
Q312	8-729-901-41	TRANSISTOR 2SC1740S		
Q611	8-729-921-42	TRANSISTOR 2SA1679		
Q615	8-729-029-46	TRANSISTOR DTA143ESA		
Q621	8-729-029-68	TRANSISTOR DTC114TSA		
Q711	8-729-029-46	TRANSISTOR DTA143ESA		
		< RESISTOR >		
R101	1-129-774-11	CARBON	1M	1/2W
R105	1-129-774-11	CARBON	1M	1/2W
R306	1-247-835-11	METAL	1.5K	1/4W

Ref. No.	Part No.	Description		Remark
*	1-468-506-11	POWER BLOCK (HS16S9F) (TW)		
		**********************		
		(Ref.No. 5,000 Series)		
		< CAPACITOR >		
C131	1-104-668-11	ELECT	33uF	35V
C132	1-126-960-11	ELECT	1uF	50V
C211	1-107-895-11	ELECT	330uF	35V
C213	1-126-947-11	ELECT	47uF	35V
C401	1-107-911-11	ELECT	220uF	35V
C402	1-126-959-11	ELECT	0.47uF	50V
C413	1-126-947-11	ELECT	47uF	35V
C511	1-107-911-11	ELECT	220uF	35V
C512	1-126-947-11	ELECT	47uF	35V
C613	1-126-947-11	ELECT	47uF	35V
C701	1-126-960-11	ELECT	1uF	50V
C703	1-126-960-11	ELECT	1uF	50V
C711	1-107-895-11	ELECT	330uF	35V
C713	1-126-948-11	ELECT	100uF	35V
		< DIODE >		
D101	9-885-000-79	DIODE S1WBA60		
D102	8-719-160-78	DIODE RD24FB2		
D104	8-719-983-03	DIODE MTZJ-T-77-2.7B		
D105	8-719-991-33	DIODE 1SS133T-77		
D131	8-719-991-33	DIODE 1SS133T-77		
D132	8-719-924-13	DIODE MTZJ-T-77-22B		
D135	8-719-030-24	DIODE EG01C		
D211	8-719-027-43	DIODE S2L20UF		
D212	8-719-160-87	DIODE RD33FB2		
D401	8-719-018-83	DIODE D2S4M		
D511	8-719-027-43	DIODE S2L20UF		
D615	8-719-064-11	DIODE SPR-325MVW (ON/STANDBY)		
D711	8-719-500-50	DIODE D3S4M		
		< FUSE >		
⚠F101	1-532-503-31	FUSE (T1.6AL/250V)		
		< IC >		
IC401	8-759-420-19	IC AN1431T		
IC611	8-759-191-58	IC AN77L035		
IC701	8-759-667-11	IC HA17L431P-TZ		

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

POWER BLOCK	SW-340

Ref. No.	Part No.	Description			Remark
		< IC LINK >			
⚠P711	1-533-593-11	LINK, IC (2A)			
		< PHOTO COUPLER >			
⚠PC101	8-749-011-50	PHOTO COUPLER PS2561L1-1-V-Q			
⚠PC102	8-749-011-50	PHOTO COUPLER PS2561L1-1-V-Q			
⚠PC103	8-749-011-50	PHOTO COUPLER PS2561L1-1-V-Q			
		< TRANSISTOR >			
Q102	8-729-023-98	TRANSISTOR 2SC3377-Q			
Q615	8-729-029-46	TRANSISTOR DTA143ESA			
Q621	8-729-029-68	TRANSISTOR DTC114TSA			
Q711	8-729-029-46	TRANSISTOR DTA143ESA			
		< RESISTOR >			
R101	1-219-774-11	CARBON	1M		1/2W
R104	1-219-777-11	CARBON	3.3M		1/2W

Ref. No.	Part No.	Description			Remark
*	A-6065-547-A	SW-340 BOARD, COMPLETE (HK, SP, CH)			
*	A-6065-560-A	SW-340 BOARD, COMPLETE (TW)			
		************************			
		(Ref. No. 3,000 Series)			
		< CAPACITOR >			
C101	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C102	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C103	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C104	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C105	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C106	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
		< CONNECTOR >			
CN101	1-779-345-11	CONNECTOR, FFC/FPC 7P			
CN102	1-794-667-11	CONNECTOR, FFC/FPC 13P			
		< DIODE >			
D101	8-719-079-90	DIODE SML-010DT-T86 (KARAOKE STAR)			
D102	8-719-079-90	DIODE SML-010DT-T86 (VES)			
D103	8-719-079-90	DIODE SML-010DT-T86 (VOCAL)			
D104	8-719-079-90	DIODE SML-010DT-T86 (♯)			
D105	8-719-079-90	DIODE SML-010DT-T86 (VOCAL SUPPORT)			
D106	8-719-059-94	DIODE SML-010MT-T86 (♮)			
D107	8-719-079-90	DIODE SML-010DT-T86 (♭)			
		< IC >			
IC101	8-759-909-71	IC BA4558F-E2			
		< TRANSISTOR >			
Q101	8-729-421-22	TRANSISTOR	UN2211-TX		
Q102	8-729-421-22	TRANSISTOR	UN2211-TX		
Q103	8-729-421-22	TRANSISTOR	UN2211-TX		
		< RESISTOR >			
R101	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R102	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R103	1-216-073-00	METAL CHIP	10K	5%	1/10W
R104	1-216-073-00	METAL CHIP	10K	5%	1/10W
R105	1-216-295-91	SHORT	0		
R106	1-216-033-00	METAL CHIP	220	5%	1/10W
R107	1-216-033-00	METAL CHIP	220	5%	1/10W
R108	1-216-033-00	METAL CHIP	220	5%	1/10W
R109	1-216-017-91	RES-CHIP	47	5%	1/10W
R110	1-216-033-00	METAL CHIP	220	5%	1/10W
R111	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R112	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R113	1-216-017-91	RES-CHIP	47	5%	1/10W
R114	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R115	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R116	1-216-017-91	RES-CHIP	47	5%	1/10W
R117	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R118	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
		< VARIABLE RESISTOR >			
RV101	1-227-233-11	RES, VAR 50K/50K (MIC1 LEVEL)			
RV102	1-227-233-11	RES, VAR 50K/50K (MIC2 LEVEL)			
RV103	1-227-233-11	RES, VAR 50K/50K (ECHO LEVEL)			
		< SWITCH >			
S101	1-762-875-21	SWITCH, KEYBOARD (VES)			
S102	1-762-875-21	SWITCH, KEYBOARD (VOCAL)			
S103	1-762-875-21	SWITCH, KEYBOARD (♯)			
S104	1-762-875-21	SWITCH, KEYBOARD (VOCAL SELECT)			
S105	1-762-875-21	SWITCH, KEYBOARD (♮)			
S106	1-762-875-21	SWITCH, KEYBOARD (VOCAL SUPPORT)			
S107	1-762-875-21	SWITCH, KEYBOARD (♭)			
S108	1-762-875-21	SWITCH, KEYBOARD (KARAOKE STAR)			

MISCELLANEOUS
****

Ref. No.	Part No.	Description	Remark
10	1-771-913-11	SWITCH, TACTILE	
13	1-757-039-11	CABLE, FLEXIBLE FLAT (FMS-015)	
14	1-757-040-11	CABLE, FLEXIBLE FLAT (FAS-001)	
110	1-792-457-11	CABLE, FLEXIBLE FLAT (FMM-33)	
113	1-769-744-91	CORD, POWER (HK, SP)	
113	1-782-510-11	CORD, POWER (CH)	
113	1-790-380-11	CORD, POWER (TW)	
220	A-6062-397-A	OPTICAL PICK-UP KHM-220AAA/J1RP	
M001	1-541-632-11	MOTOR, DC (LOADING)	

ACCESSORIES & PACKING MATERIALS
****

Ref. No.	Part No.	Description	Remark
	1-418-991-41	COMMANDER, STANDARD (RMT-D118E)	
	1-575-334-11	CORD, CONNECTION (STEREO AV CABLE 1.5m)	
	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (HK)	
	3-053-633-01	COVER, BATTERY (for RMT-D118E)	
	3-063-038-11	MANUAL, INSTRUCTION (ENGLISH) (HK, SP)	
	3-063-038-21	MANUAL, INSTRUCTION (SIMPLIFIED CHINESE) (SP)	
	3-063-038-31	MANUAL, INSTRUCTION (TRADITIONAL CHINESE) (HK)	
	3-063-405-11	MANUAL, INSTRUCTION (ENGLISH) (TW)	
	3-063-405-21	MANUAL, INSTRUCTION (TRADITIONAL CHINESE) (TW)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
	3-063-406-11	MANUAL, INSTRUCTION (ENGLISH) (CH)	
	3-063-406-21	MANUAL, INSTRUCTION (SIMPLIFIED CHINESE) (CH)	

9-921-775-11

Sony Corporation
Network Entertainment Group

2000G0530076-1F
Printed in Japan © 2000. 7
Published by Quality Assurance Dept.